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Original Articles

ACUTE MENINGITIS.

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By the term meningitis is understood inflammation of the pia arachnoid, the investing membrane of the brain and spinal cord. Considered as a single membrane, it consists of a serous surface (arachnoid) forming one side of the subdural space and beneath this a loose connective tissue, the pia mater, which carries the blood vessels for the brain and cord. The brain, covered by this membrane, projects into the subdural space as the heart projects into the pericardial cavity. In addition to the vessels, there are numerous lymphatics, which are situated in the adventitial sheaths of the veins and arteries and which are continued with these vessels into the brain. They are true lymphatic vessels with an endothelial lining; they are thin-walled, and, when distended, communicate freely with the tissue spaces. There are no lymphatics in the tissue of the brain itself, nor have lymph spaces, similar to the spaces in other tissues, been demonstrated. The adventitial lymphatics are not continued into the capillary walls. Between the capillaries and the walls of the channels in which they run there are spaces, easily distended, which are in relation with the closely-woven web of the nervous tissue, allowing a free interchange of fluid. Such fluid easily finds its way into the adventitial lymphatics. The relation, by means of blood vessels and lymphatics, between the nervous tissue and the investing membrane is so close that infectious processes in one extend into the other. Strictly speaking, all cases of meningitis deserve the term meningo-encephalitis. The lymphatics of the membrane communicate with the general lymphatic system of the body by means of the lymphatics along the nerves and great vessels.

The pia arachnoid, in the form of the choroid plexus, passes into the ventricles of the brain, and the intraventricular fluid finds its way into the interspaces of the membrane through the foramen of Magendie. The deep cervical lymph nodes belong to the membrane. The pia arachnoid contains the few connective tissue cells of the fibrous tissue, the cells of the blood and lymphatic vessels, and a variable number of lymphoid cells.

There are various means by which infectious agents can gain access to this tissue. They may enter it by means of the blood or by the extension of infectious processes from adjacent regions. The extension may be direct or by means of lymphatics which communicate with those of the membrane.

All inflammatory processes in the pia arachnoid, however produced, agree more or less in their anatomic features. There are, however, certain minor differences in the anatomic lesions which are sufficient to differentiate certain forms of meningitis from others. In certain cases these differences are more accentuated than they are in others. The same character of exudation may be produced by the *Diplococcus intracellularis meningitidis*, by the pneumococcus, and by the streptococcus. Even cases of tuberculous meningitis may be found in which there may be a fibrino-purulent exudation without the presence of tubercles. The differences lie mainly in the extent and character of the involvement of the brain, and in the degree to which the intima of the veins and arteries is affected. It would be possible anatomically to distinguish cases of acute epidemic cerebrospinal meningitis from other forms, but the differentiation could not be carried further. All cases of meningitis are cerebrospinal, the meninges of the cord being affected as well as those of the brain. In certain forms, the cord lesions are more marked.

Acute meningitis may be produced by a number of bacteria, but chiefly by those belonging to the pyogenic organisms. The three organisms most generally concerned are the *Diplococcus intracellularis meningitidis*, the pneumococcus, and the streptococcus. Of these, the first named deserves the most attention in that it is the cause of the epidemic form of the disease. This organism was first described by Weichselbaum, in 1887, as a specific micrococcus resembling the gonococcus. He found it in six cases of acute cerebrospinal meningitis. The work was confirmed by several investigators, and, in 1895, Jäger found it in a small epidemic which prevailed in the garrison at Stuttgart. To Jäger belongs the credit of first recognizing this organism as the cause of epidemic cerebrospinal meningitis. The description which Jäger gave of the organism differs in minor details from that given by Weichselbaum. Weichselbaum has never regarded it as the sole cause of epidemic meningitis but considers that epidemics also may be caused by the pneumococcus. In the very considerable epidemic which prevailed in Massachusetts in 1897, and which was reported by Councilman, Mallory and Wright, this diplococcus was established as the only cause. It was found in 31 of the 35 cases which came to autopsy. Lumbar puncture was performed in 55 cases, and in 38 of these the same organism was found. It was present in all of the acute cases, but rarely in those which ran a more chronic course. Thus, in lumbar puncture, the average duration from the onset of disease until the puncture was made was seven days in the cases in which the organism was found, and seventeen days in the negative cases.

The organism is one which is cultivated with difficulty. Morphologically, the organisms appear as diplococci occurring as paired hemispheres, separated by

well-marked, unstained intervals, and showing in cultures considerable variation in size. There is a tendency to grouping in fours, or tetrads. In cover-glass preparations from the meningeal exudate, the diplococcus is frequently situated inside leucocytes and sometimes within the nucleus. The appearance is very much like that of gonorrheal pus. The organism is decolorized by the Gram method of staining; in cultures it grows best on blood serum. The colonies are round, colorless, slightly convex or flat, moist and viscid-looking; they may become confluent. The organism has feeble vitality and dies out quickly under cultivation. It has a weak pathogenesis for laboratory animals. The cultures vary in virulence in certain cases, 1 c.c. of a bouillon suspension of a 24-hour blood serum collected and injected intraperitoneally in a guinea-pig will kill the animal in 48 hours.[1]

This type of meningitis is constantly present; it exists in the form of epidemics, which are repeated with some regularity. The disease has peculiar interest in Massachusetts from the fact that it was first described here by Danielsen and Mann, in 1806. There have been four epidemics in the state, each of which has been made the subject of a special report. These epidemics occurred in 1809, 1864, 1874 and 1897. There is great difference in the morbidity and mortality of the disease in the different epidemics; Hirsch places the mortality at from 20 to 75 per cent. In the last epidemic, in Boston, the mortality was 65 per cent.; the epidemics are usually of short duration. Between the epidemics, sporadic cases appear, which may be more numerous in some years than in others. Before careful bacteriologic examinations rendered the recognition of the disease certain, the character of the infection in sporadic cases was determined by the clinical history, with or without the reports of autopsies. The disease is sufficiently characteristic to make this method approximately correct. In 1897, from the clinical reports, in some cases with autopsies, it seemed probable that here and in Europe sporadic cases were common. The main clinical features distinguishing sporadic cases of epidemic cerebrospinal meningitis from other forms of meningitis were the low mortality (in 24 cases from the clinic of Prof. Bauer, reported in 1890, there were 8 deaths, and in 17 cases reported from Ziemssen's clinic at the same time there were 3 deaths), its appearance as a primary affection, and the frequency with which it is followed by secondary affections of the eye and ear.

Since our study of the disease in 1897 there have been numerous reports of sporadic cases, in which careful bacteriologic study of the exudation have determined the presence of the *Diplococcus intracellularis meningitidis*, and have confirmed the conclusions which we reached in 1897 of the frequency of sporadic cases. Since 1898 there have been 61 autopsies on meningitis at the Boston City and Massachusetts General Hospitals, with bacteriologic study of the exudation. In 13 of these the *Diplococcus intracellularis meningitidis* was found in culture. In addition to these there were 8 cases which were considered due to the same cause but in which the organism was not obtained in cultures. Of these 5 were chronic, with organization of exudation, the organism having evidently died out, and in 3 the cultures were negative from unknown causes. All of these cases were primary and did not differ from the type of disease which we had studied in the epidemic in 1897. The absence of bacteria in carefully made cultures of the exudation in acute primary meningitis speaks in favor of this type, for the diplococcus is rather difficult to cultivate, of feeble vitality and can easily die out.

These statistics give no idea of the frequency of the disease. We know that cases do recover, for there are numerous reports of recovery of cases in which the diplococcus has been found in the fluid from spinal puncture. There is great need of more accurate statistics on this subject, and these are to be obtained by careful bacteriologic examination of fluid derived from spinal puncture, in large numbers of cases, including those in which the disease may only be suspected.

Examination of the health statistics in Massachusetts shows a gradual decline in the number of deaths from epidemic cerebrospinal meningitis from 1897 to 1902. In 1897, which was the chief year of the epidemic, there were 355 cases. The deaths were most numerous in April, May and June, which are the months in which the epidemics are most fatal. In 1898 there were 259 cases, the epidemic influence being slightly shown by 91 cases in the same months. In 1899 there were 240 cases, in 1900, 165; in 1901, 176, and in 1902, 165 cases. These cases were scattered over the state without occurring in sufficient numbers in any one place to constitute an epidemic. There is no way of positively determining whether or not they were due to the *Diplococcus intracellularis*. In the Massachusetts reports, other forms of meningitis were placed under the head of cephalitis until 1901, when the term "other forms of meningitis" was used. In 1900 there were 1,205 cases of cerebritis, in 1901, 1,168 cases of other forms of meningitis, and in 1902, 1,200 cases. The cases described as cerebrospinal meningitis are the primary cases, the secondary cases coming under other forms. It is, of course, difficult to determine, without an autopsy account, whether meningitis is or is not primary. All my experience leads me to the belief that, with rare exceptions, cases of primary meningitis are due to the *Diplococcus intracellularis*. In the 35 autopsies made in 1897, all the cases were primary, and the 21 found since were also primary. In the remaining 40 of the 58 cases only 2, in 1 of which the pneumococcus was found and in 1 the streptococcus, were regarded as primary. It can be concluded, both from autopsy evidence and from statistics, that sporadic cases of meningitis due to *Diplococcus intracellularis* are of frequent occurrence, but we have no way of determining how frequent the disease is. Autopsy experience shows that the disease is more frequently not diagnosed when present than the reverse. We have no means of estimating the mortality of meningitis due to the pneumococcus or streptococcus; these cases are usually secondary, and the mortality in secondary meningitis is much higher than in the primary form. Up to 1898 we could not find a case in which the culture of fluid from spinal puncture showed pneumococci or streptococci in which recovery took place. Since 1898 there have been, at the Boston City Hospital, 4 lumbar punctures in which the pneumococcus was found and three in which the streptococcus was found, all of which cases resulted fatally. To a certain extent, we can judge of the frequency of the disease by evidences at autopsies of preceding inflammation of the pia arachnoid, shown by thickening due to connective tissue increase and by lymphocyte infiltration with a corresponding increase in the glia of the cortex, and glia thickening and granulations

1. Mallory and Wright: Pathological Technic, 1904.

on the surface of the ventricles. This condition, which is not uncommon, can be the result of a preceding acute infection, but certainly not all cases are the result of this.

The presence of these sporadic cases is of importance in the occurrence of epidemics. The *Diplococcus intracellularis* is an organism of feeble vitality; it dies out easily on exposure to drying and light and is incapable of a saprophytic existence. In the absence of intervening infections, it would be impossible for the period of epidemics to be bridged over. Not only this, but there is evidence that this organism can produce other infections and may even live as an inhabitant on the normal mucous membrane. There have been a great many cases reported of the presence of the *Diplococcus intracellularis meningitidis* in the nose. In most of these the diagnosis was made on morphologic grounds, and such cases should be thrown out, owing to the probability that the organism was confounded with the micrococcus catarrhalis, which it resembles in morphology and in staining reaction. The differential diagnosis can only be made in cultures. In fifteen cases of meningitis examined in the Boston epidemic, diplococci decolorized by Gram were found in 10. In 12 cases, chosen at random, similar diplococci were found in 2. Attempts were made to cultivate the organisms, but not successfully.

Lord has examined the bacteria of the nose in 21 cases. In the nose of a physician who had been in daily attendance in the throat room and who had a severe rhinitis with congestion of the mucous membrane and profuse muco-purulent discharge, he found diplococci which all tests showed to be the meningitidis. In reviewing the literature, Lord accepts but 3 cases, making, with his own, four, in which the *Diplococcus intracellularis* has certainly been found in the nose. Some of these cases are of considerable interest. Kiefer, after experimenting for some days with the cultivation of the organism with the view of comparing it with the gonococcus, suddenly acquired a severe purulent rhinitis, with headache, nervousness and an uncomfortable sense of contraction of the neck. The temperature remained normal. Examination of the nasal pus by cultures demonstrated the presence of the *Diplococcus intracellularis*, along with other bacteria; the rhinitis lasted 14 days. In this case it seemed probable that there was a primary infection of the nose, with a slight meningitis, resulting from extension of the infection through the lymphatics into the meninges. The case lacks the proof which spinal puncture should have given, both of the meningitis and of the character of the meningeal infection, if present. There can be no doubt that extension may take place from the meninges into the nose, just as it certainly does into the ears and eyes. Rhinitis is not an uncommon condition in acute meningitis, and Albrecht and Ghon found the *Diplococcus intracellularis* by culture from the nose in one of their cases of acute meningitis. The evidence which we have justifies us in the conclusion that there is a form of meningitis produced by the *Diplococcus intracellularis meningitidis*, that the epidemics of acute meningitis are due to this organism, that sporadic cases are not infrequent, that, with rare exceptions, primary cases of meningitis are due to this organism; that recovery takes place much more frequently in this type of disease than when infection is due either to the pneumococcus or the streptococcus, that the disease is more common than is generally supposed, that the organism does not live as a saprophyte outside the body, that the organism may be found on the mucous membrane of the nose, where it may produce a rhinitis, and that it is probable that infection of the meninges takes place by extension from some of the adjacent mucous membranes by means of the lymphatics. We can only explain the epidemics of the disease by the assumption that at certain times the power of infection is increased either by an increase in the virulence of the diplococcus or by a decrease in the resistance of the tissues. The study of the influenza bacillus in the past years has shown much the same condition. The organism is constantly present, and not only are sporadic infections produced by it frequent, but the bacillus may live as a harmless inhabitant of a mucous surface. The causes underlying the occurrence of epidemics are unknown, and even atmospheric conditions can not be excluded. With regard to the pneumococcus, we know that the organism is associated with acute croupous pneumonia, but we do not know the underlying conditions which enable the pneumococcus to produce this disease.

Of the 61 cases of sporadic meningitis seen since 1897, 18 were found to be due to the pneumococcus. Weichselbaum regards this organism as one of the most frequent excitors of both primary and secondary meningitis, and both he and Netter believe that meningitis due to the pneumococcus may appear in epidemic form. In the report on meningitis in 1898, 10 cases were found to be due to the pneumococcus, and in 2 of these the infection was primary, no other lesions due to the organism having been found. In but one of the recent cases was the infection primary in the meninges, and even here the accompaniment of an acute nephritis suggests a preceding acute infection. In 6 cases the infection was secondary to otitis media and mastoiditis; in 1 case it was secondary to an infection of a tumor of the sphenoid; in 1 case it was associated with the streptococcus, secondary to fracture of skull and operation; in 1 case it was secondary to abscess of the prostate; in 1 case it was secondary to acute infection of ethmoid, "the pores of right cribiform plate contain fibrinous pus in continuity with exudation about right olfactory lobe," in 2 cases it was secondary to acute croupous pneumonia, in 4 cases it was secondary to acute bronchopneumonia and pleurisy, and in 2 cases it was secondary to acute pneumococcus endocarditis.

In but few of these cases did the infection appear to be embolic; in most cases the extension to the meninges was by continuity or by the lymphatics. In its general pathogenic properties, the pneumococcus attacks tissues from mucous surfaces and extends in the body by surfaces. I believe that the frequency of pneumococcus meningitis is greatly overestimated, and especially its frequency secondary to pneumonia.

While vital statistics with regard to the occurrence of disease are not worth much, owing to errors in diagnosis, Chart 1, showing the relative frequency of pneumonia and meningitis in different months, gives some light on the relation between meningitis and pneumonia. The deaths from these diseases in Massachusetts have been taken during a period of five years in order to cover slight inequalities in different years, commencing in 1898, the year following the epidemic of cerebrospinal meningitis. If there is any marked relation between meningitis and pneumonia it should be shown in the inter-occurrence of the diseases. We see from the chart that the greatest number of deaths from what are described as other forms of meningitis occur in

August, when the mortality from pneumonia is lowest. It is very possible that the high number of cases in March, April and May is due to confusion of these cases with primary meningitis due to the *Diplococcus intracellularis*, for these months show the highest mortality in epidemics and in sporadic cases due to this organism. The curve made from the statistics made in New York City, showing the relation between deaths from acute respiratory diseases and cerebrospinal meningitis in five years, shows much the same. It is interesting to see that the apex of the acute respiratory diseases curve in New York is reached in April, while the apex of the pneumonia curve in Massachusetts is reached in March (Chart 2).

There were 18 cases of streptococcus infection, and in 1 the infection was primary. In seven cases it was secondary to fracture or operation wound of the skull; in 8 cases it was secondary to otitis media and mastoiditis, in 1 case it was secondary to acute streptococcus endocarditis, and in 1 it was secondary to acute bronchopneumonia and acute cystitis. We see from this analysis that, in the two hospitals mentioned, fatal sporadic cases of meningitis are equally divided between the three organisms which are to be regarded as the main etiologic factors. Of the remaining 4 cases, 2 were produced by the *Staphylococcus pyogenes aureus*, 1 was secondary to trauma with following operation, and 1 was secondary to empyema. In two cases the nature of the infection was not determined. In one of the cases reported in 1898 the meningitis was produced by the anthrax bacillus and was secondary to a primary lesion on the face. We have never had any cases due to the typhoid bacilli.

The pathologic process in meningitis due to the *Diplococcus intracellularis* consists in inflammation, with purulent, sero-purulent and fibrino-purulent exudation. The most marked lesions are found at the base of the brain, extending from the optic commissure backward over the crura, the pons and medulla. On the convexity of the brain the exudation is usually most intense on the lateral surface, little or none being found in the meninges of the longitudinal fissure. The meninges of the cerebellum are always involved and often the greatest mass of the exudation is found on the upper surface of this structure. In the most acute cases, those dying a few days after the onset, there may be a little more than intense hyperemia of the vessels of the meninges and cortex. In the more advanced cases, dying from 5 to 12 days after the onset, the amount of exudation is much greater and has a tough, rather gelatinous character. In the chronic cases, in which death has occurred in from 15 to 30 days from the onset, there is edema and general thickening of the meninges, which is most marked at those localities where the acute process is most evident. In one case, the duration of which was apparently over 30 days, the entire medulla was embedded in a dense mass of connective tissue. In the cord the exudation is most marked along the posterior surface and may be found here in large amount, while the anterior surface may show only cloudiness and injection. There is usually more exudation along the dorsal and lumbar cord than along the cervical.

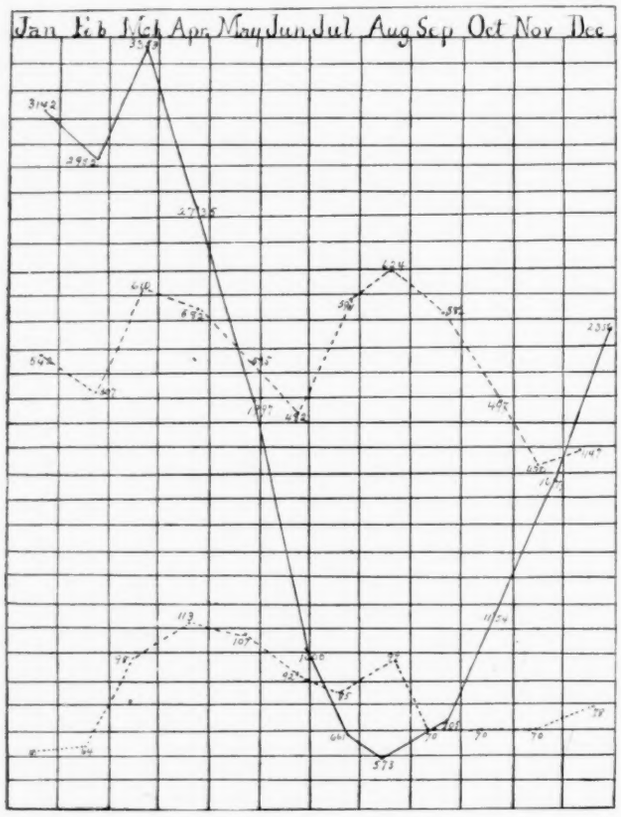

Chart 1.—Deaths from pneumonia, meningitis and epidemic cerebrospinal meningitis in Massachusetts from 1898 to 1902 inclusive. The unbroken line represents pneumonia, the middle line meningitis and the lower line epidemic cerebrospinal meningitis; it is probable that these two forms of meningitis are to some extent intermingled.

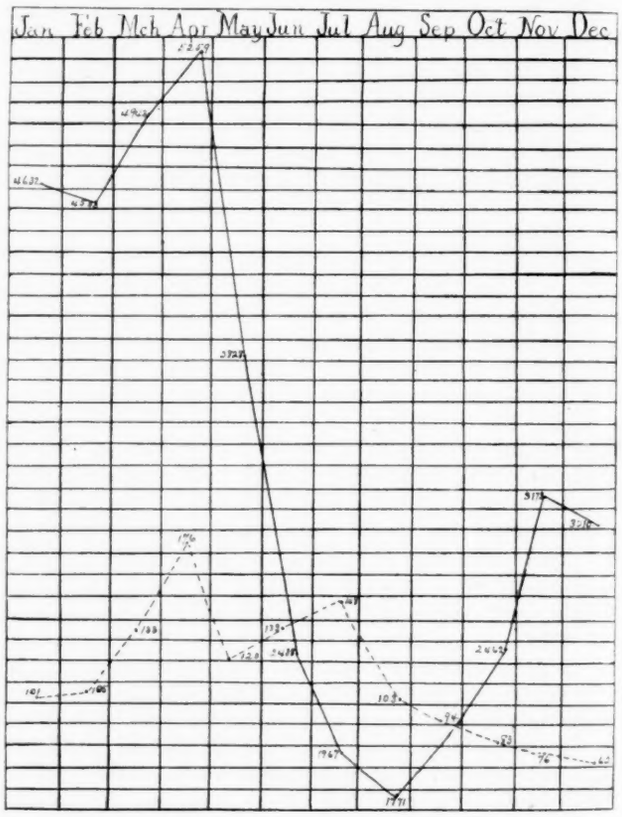

Chart 2.—Acute respiratory diseases and meningitis in New York City from 1898 to 1902 inclusive. The unbroken line represents deaths from acute respiratory diseases. The broken line represents deaths from meningitis. No attempt is made to distinguish between the various forms of meningitis.

In 8 of 35 cases on which autopsies were made in the epidemic studies, there were definite macroscopic lesions in the brain, consisting in hemorrhages in the white matter. No abscesses were found. The cranial nerves were affected to a greater or less degree in all cases. Those most affected were the second, fifth, seventh and eighth. They were embedded in the exudation which extended along them, and on section they were found to be swollen and reddened. The gasserian ganglia were examined in a number of cases, and in all they were found swollen and softened. The spinal nerves were also affected; the nerve roots were embedded in the exudation and the spinal ganglia were red and swollen. The exudation was also found around the nerves of the cauda equina.

Microscopically, the exudation in the most acute cases was purulent and the leucocytes were exclusively polynuclear. The absence of eosinophile cells was remarkable. In more advanced cases the number of cells in the exudation was greater and the fibrin was abundant. As the process advanced, large endothelial phagocytic cells became increasingly numerous, and in some cases made up a large part of the exudation. They often contained from one to several polynuclear leucocytes enclosed in vacuoles and showing varying degrees of disintegration.

In the chronic cases the exudation was mainly represented by degenerated pus cells. In these chronic cases there were also numbers of plasma and lymphoid cells.

Microscopically, lesions of the tissue of the brain and cord were absent in but few cases. They were most evident in those cases in which from 5 to 10 days elapsed from the onset of the disease until death. The blood vessels of the convexity were injected. The cortex appeared redder and the tissue edematous. In places there was circumscribed infiltration of the tissue with pus cells, which extended downward from the infiltration in the meninges. This infiltration was usually most marked in the outermost layer of the cortex above the ganglion cells, but in some places it extended among the ganglion cells and even into the white matter. Single pus cells were often found in the brain tissue, apparently remote from the areas of infiltration. In 2 cases extensive softening, with purulent infiltration and hemorrhage, was found in the cortex of the cerebellum. These pus cells in the brain were irregularly distributed in the tissue, and were found both in places which appeared to be altered by infiltration of edematous fluid and in those in which the intracellular material seemed to be normal. The pus cells in the tissue were often distorted in shape, sometimes extending in long lines, the shapes resembling those seen in pus cells wandering in the tissue of the cornea. Their situation and shape did not seem to indicate the existence of preformed spaces. They were but rarely found around the ganglion cells.

In certain areas in the cortex, particularly about the vessels, large numbers of large endothelial cells resembling those in the meninges were often found. They were apparently formed by proliferation of the cells in the adventitial tissue. They extended often for some distance in the tissue around the vessels where this showed evidence of disintegration, but they seemed to have little or no power of wandering into tissue which was comparatively normal. The presence of these cells is important in relation to the neuroglia cells. Proliferative changes in the neuroglia were constantly present. In the chronic cases there was a distinct increase in neuroglia fibrils, together with increase of cells, which was chiefly marked in the tissue of the ventricles and in the outermost layer of the cortex. In several of the more acute cases numerous nuclear figures were found in the cells of the neuroglia. These were particularly marked in one case. The proliferating neuroglia cells somewhat resemble the large endothelial cells. There is an increase of nucleus with the formation of evident protoplasm about it. The nuclear figures are well marked, showing spindles and centrosomes. Often large cells with several nuclei result from such proliferation. In one specimen in which this was most marked, nuclear figures were also found in the so-called Trabant cells adjoining the ganglion cells.

Analogy with other tissues would indicate that such changes in the intercellular tissue consisting of proliferation of fixed tissue elements and exudation of leucocytes would be accompanied by degeneration of the specific cells of the tissue, namely, the ganglion cells. The most evident changes in the ganglion cells were found in those places where disintegration of the tissue was best marked, and consisted in disintegration of the cell protoplasm. It is difficult to distinguish such conditions from artefacts. Degeneration of nerve cells is not of the same character as degeneration of parenchymatous cells in other organs. The state of our knowledge with regard to structure of ganglion cells and arrangement of granules is not sufficiently definite to enable us to determine with certainty their degenerations.

The most marked changes in the nerves were found in the second, fifth and eighth; the lesions of the nerves represent an extension of the inflammatory process from the meninges.

The dural covering of the optic nerve in the orbit showed little change save dilatation of vessels. The subdural space was dilated and the exudation was found in the pia arachnoid of the nerve. From the meninges the infiltration extended more or less into the nerve itself. In both the optic and olfactory nerves, proliferation of the neuroglia cells was shown similar to that in the brain. The exudation may extend along the optic nerve into the eye.

In acute cases, section of the eighth nerve showed it embedded in a mass of pus, its sheaths softened, broken up and in places entirely gone. The nerve was infiltrated with numbers of pus cells, partly in the form of lines running through it, partly in a more diffuse infiltration. The seventh nerve often showed as great a degree of infiltration as the eighth. Longitudinal section of the fifth nerve extending into the gasserian ganglion showed intense neuritis in the nerve on the cerebral side of the ganglion. Similar changes of the nerve roots and ganglion of the spinal cord were found in all cases which were examined. In some of the more chronic cases, lesions of the nerve roots of the spinal cord were more marked than in the acute cases.

In the chronic cases there was marked thickening of the meninges due to connective tissue formation and a marked increase of the neuroglia of the cortex. There was little evident exudation, circumscribed yellowish foci marking the remains of it. The meninges at the base were opaque, and were enormously thickened, and there were bands of organized tissue extending from point to point. In one of the most chronic cases, in which the duration of the disease could not be ascertained with any accuracy, owing to the mental condition of the patient when brought into the hospital, the meningeal changes simulated general paralysis. The only

evidence of exudation was in the ventricles, in which masses of partly organized fibrin were found adherent to the lining. In another case the entire medulla was so embedded in a dense mass of connective tissue that it was difficult to remove it. Chronic hydrocephalus is not uncommon in such cases. It is due to closure of the foramen of Magendie by organization of the exudation about the cerebellum.

There is some difference in the character of the lesions due to pneumococcus and streptococcus, as compared with those due to the *Diplococcus intracellularis*, but no differences between lesions due to the pneumococcus and streptococcus. Endovascular lesions, consisting in cellular infiltration behind the endothelium, were found in both arteries and veins in meningitis due to the pneumococcus and streptococcus. The endothelium was preserved and often formed festoons projecting into the lumen of the vessel, with the cell accumulations behind it. The endothelial cells were swollen, but otherwise unaltered. I do not believe that the large cells arise from proliferation of the endothelium, but they seem to reach their position by emigration from the interior of the vessel. In meningitis due to these organisms there is also less tendency to involvement of the tissue of the brain and cord, nor is the extension along the nerves so marked. The cases of these forms of meningitis have not been so numerous nor has their anatomic study been so thorough as in the cases due to the intracellularis.

THE SURGICAL ASPECTS OF MAJOR NEURALGIA OF THE TRIGEMINAL NERVE.

A REPORT OF TWENTY CASES OF OPERATION ON THE GASSERIAN GANGLION, WITH ANATOMIC AND PHYSIOLOGIC NOTES ON THE CONSEQUENCES OF ITS REMOVAL.

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(*Continued from page 929.*)

CASE 16.—Mrs. R., aged 55, was referred to me by Dr. Baker of Elmira, N. Y., through Dr. Osler.

History.—She had suffered for fifteen years with a neuralgia which originated in the supraorbital territory. It had become acutely aggravated a few years before her ganglion operation after an exposure to a cold wind. She had taken opiates in large doses during this entire period and, indeed, had been addicted to the habit before the onset of her neuralgia. For the last year the pain had been extreme and almost continuous. A constant attendant was necessary, day and night. All inhibition was lost and she invariably screamed aloud during her paroxysms. She was more or less narcotized most of the time and seemingly was maniacal. The teeth had all been extracted at one sitting two years before. No peripheral neurectomies had been undertaken. The entire territory of the fifth nerve was involved. Pain was in the tongue, in the inside of the ear and nose, as well as in the more commonly described areas. She presented the awful appearance of an extreme case of tic, screaming and clutching at everything during her frequently recurring exacerbations of pain; dirty, with matted white hair, full of sebaceous discharge, her head and face having been unwashed for many months. She looked twenty years more than her actual age.

Examination.—Physical examination discloses a very unpromising condition. An advanced degree of arteriosclerosis was present. The urine had a specific gravity of 1030 and contained a large amount of sugar. She was unable to speak or to protrude her tongue, and her condition was so serious that most of the usual preliminary examinations were omitted. Owing to the disturbance caused by her frequent cries, she was operated on almost as an emergency a few hours after admission, as it would have been imposible to have kept her over night in the hospital

Operation.—May 15, 1903; Union Protestant Infirmary; ether. Anesthesia of necessity was administered before any operative preparations could be undertaken. When the side of the head was scrubbed and cleaned, almost the entire epithelium came away, leaving practically a raw surface. Owing to her serious condition, the operative approach was conducted somewhat more hurriedly than should have been done, and by the carelessness of mistaking the ramus of the third for that of the second division, the meningeal artery was torn off at its point of emergence into the cranial cavity at an early stage of the operation. This is the first time that this accident has occurred and it sufficed to show the operator how serious a complication it may be, in delaying and in preventing a subsequent clean neurectomy. The vessel was finally controlled, but the difficulties of the enucleation were such as to preclude the removal of more than the lower two-thirds of the ganglion. It would have been impossible in a case of this kind to have exposed the trigeminal root in order to divide that and thus save the time necessary for the extraction of the ganglion. The wound was sufficiently dry to allow closure without drainage.

Postoperative Notes.—A critical condition, with anuria, Cheynes-Stokes respiration, and a pulse varying between 130 and 160, ensued for twenty-four hours after the operation. It was feared that a condition of diabetic coma was imminent and would lead to her death. Happily, she awakened from her comatose condition, as it were, well on the morning of the third day. The wound healed *per primam*. Her drugs were gradually withdrawn and a fight ensued to keep her from them. The sugar disappeared completely from the urine. An enormous appetite resulted in a very rapid gain of weight. There were no ocular complications. She returned home on the tenth day and reports that she has since remained free from pain. She has, unfortunately, resumed or continued her morphia habit.

This and the case of sinus injury are the only ones in the series which developed any critical postoperative complications.

CASE 17.—Mr. F. T. M., aged 58; a bookkeeper.

History.—He had suffered with a right-sided neuralgia for nine years. The pain originated in the supraorbital region and soon spread to the other divisions. All his teeth had been extracted. In 1898, an infraorbital neurectomy had been done, in Charleston, with a respite of four months. In 1899, other peripheral operations were performed, with little if any relief, and since then the pain has steadily increased despite all forms of treatment. Eating, drinking, almost any movement, in fact, of the palate or tongue, would inaugurate a paroxysm. His weight in consequence had dropped to 102½ pounds. He takes a large amount of morphia daily.

Examination.—Examination showed a greatly emaciated, gray, senile appearing man, with tortuous radials, so ill and suffering so greatly that preliminary observations had to be omitted.

Operation and Result.—July 11, 1903; The Church Home; ether. This proved to be a very easy case without complications, with a total extirpation and closure without drainage. The patient's convalescence and recovery were without incident worthy of mention (Fig. 29). He gained 14½ pounds during the three weeks subsequent to the operation, and his intelligent co-operation enabled me to make many of the observations on the physiology of the fifth nerve which will be subsequently recorded. He has remained well.

CASE 18.—Mr. J. P. B., aged 53; a farmer.

History.—His neuralgia has been of ten years' standing, having originated in the nasolabial region of the right cheek. Even from the onset it has been severe, with flash-like paroxysms, which extended early into the territory of the first di-

vision. All the teeth in the right upper quadrant were extracted. For the past year the pain has been especially severe; he has had little food or sleep, and has been unable for many months to comb his hair or to touch his beard, both of which are long and unkempt. A suboccipital extension has been present for several weeks and there are indications also that the third division has become involved. He has been confined to bed most of the time for many months. He cries out

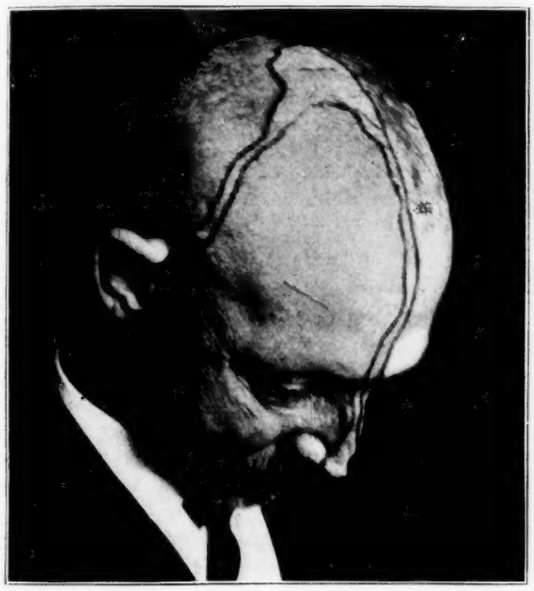

Fig. 29.—Case 15. Tenth day; incision barely perceptible. Areas of anesthesia and tactual anesthesia.

with pain during the paroxysms. Physical examination is practically negative.

Operation.—July 27, 1903; Church Home; chloroform. The exposure in this case was dry and the extirpation easy (Fig. 30). Slight bleeding occurred during the liberation of the second and third divisions. It would have been a simple matter in this case to have divided the sensory root. A drain was left in the posterior angle of the incision for twenty-four hours. The highest temperature registered after the operation was 99.6. Areas of anesthesia are shown in Fig. 31.

Postoperative Notes.—His convalescence, otherwise uneventful, was unfortunately complicated by an attack of perineal herpes on the tenth day, which, with its attendant discomforts,

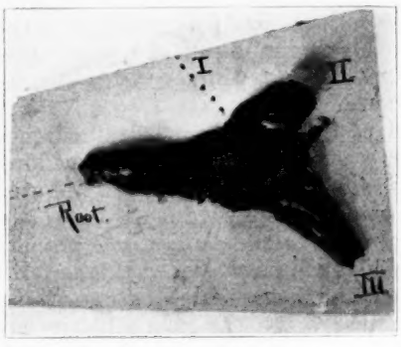

Fig. 30.—Ganglion from Case 18. Under surface showing motor root beneath the ramus mandibularis.

incapacitated him for some time. A note on the relationship of herpes to the ganglion extirpation has been made elsewhere.[30] On recovering from the discomforts of his herpes, he made rapid strides in gaining strength. His weight increased in the following two weeks from 107½ to 125 pounds, and since his return home he has exceeded his normal weight, namely, of 140 pounds. No ocular disturbances. He remains well.

30. Johns Hopkins Hosp. Bulletin, July, 1904, vol. xxv, p. 233.

CASE 19.—Mrs. A. R., aged 73, was referred to me by Dr. J. M. T. Finney.

History.—This patient suffered from a left-sided neuralgia, which had begun in the third division. It was of eight years' duration and was from the onset associated with intra-buccal pain, especially in the tongue. Her teeth had been extracted four years previously. In 1900, a peripheral operation, on the

Fig. 31.—Case 18. Twelfth day. Typical lines of anesthesia for pain and touch.

Fig. 32.—Case 19. Tenth day. Outline of tactual anesthesia alone.

third division, had been done, with relief for only a few months. A second neurectomy was performed in 1902, with intraoral evulsion both of the inferior dental and lingual. Pain soon returned in the old areas.

Examination.—Examination shows a delicate, little, old woman, with a dilated heart, with albumin in the urine, with râles at the bases of both lungs, and with a very sclerotic radial artery. She is barely able to talk, owing to her pain.

Eating and swallowing are most difficult, and opening of the mouth and protrusion of the tongue are almost impossible. The paroxysms from the beginning have been limited almost entirely to the distribution of the *N. mandibularis*, although there has been some evidence of involvement of the second division.

Operation.—July 28, 1903; Church Home; chloroform. The extirpation proved to be a difficult one, as has been my unfortunate experience in all cases in women. Considerable bleeding was encountered almost from the onset, from skin incision, diploe, dura and neighborhood of the ganglion. Extraction of the latter was attempted, although its upper border had not been completely freed from the cavernous sinus, and it was found impossible to expose the root. The sensory root, unluckily, did not come away entire when the ganglion was evulsed, and together with the first division was left behind. As would be expected, there has been a subsequent slight return of sensation, with accompanying discomforts, in the territory of the first division, such as occurred in Case 12. The wound was drained.

Postoperative Notes.—For several days after the operation, accompanying the loss of cerebrospinal fluid, the usual postoperative headache was complained of. This, however, contrary to the usual rule, was bilateral and presaged the return of sensation in the forehead. No ocular palsies were present, but what was even more troublesome, an acute conjunctivitis followed the operation, with abundant discharge from the eye, so that for several weeks painstaking care was necessary to obviate the risk of any possible ulceration. There was a rapid postoperative gain in weight, from 100½ pounds to 120 (Fig. 32).

The wisdom of attacking the ganglion in this case might be questioned, and its performance was contrary to the usual operative requirements, namely, involvement of all three divisions. The patient's condition, however, was more serious than the history would indicate, for the intrabuccal nature of the pain rendered her incapable of taking nourishment, and the operation was urged by the patient, her friends and her physician. There is some disappointment in the result, for, though her neuralgia is relieved, there are some discomforts in the field of the traumatized first division, which was previously exempt.

CASE 20.—A man, aged 32, a merchant, was referred to me by Dr. Martin of Montreal.

History.—Even before the onset of his neuralgia, he never enjoyed very robust health. The history mentions a severe typhoid infection with rib necrosis, double "hip disease," and on one occasion a pleurisy which led to a year's residence in Colorado. The neuralgia has been of four and a half years' duration, having originated without assignable cause in the maxillary division, great difficulty in talking, eating, etc., having been present from the first. The pain soon extended into the orbit and areas of the ophthalmic division; later into the mandibular areas. There have been weeks at a time when he has suffered from paroxysms of the most extreme type. All forms of treatment have been practically unavailing, though there have been occasional periods of remission in the intensity of the pain, one of these occurring while under the care of Dr. Ferrier after a prolonged treatment of electricity and hypnotism, so that for a time some doubt was thrown on the genuineness of the neuralgia. The pain returned with such intensity that in 1892 a peripheral operation was performed with evulsion of the inferior dental and infraorbital. Complete relief ensued for only six months with return of pain, which after a year has gradually approached its original degree of severity, with frequently recurring paroxysms of short duration but great intensity. He has courageously kept away from opiates.

Operation and Results.—June 21, 1904; ether. The operation presented no great difficulties. The extirpation was complete, including the trigeminal root and ophthalmic division. Convalescence was uninterrupted; the patient sat up on the second day and was out in one week. There was pressure palsy of the third nerve which began to clear up on the fifth day. The loss of senso-mobility in the face was so marked as to closely simulate for a time a true motor (facial) palsy; the muscles, however, reacted to faradism at all times.

ADDITIONAL CASES.

In addition to these 20 cases, given above, of actual or attempted extirpation for true neuralgia the ganglion has been removed for pain on two occasions when a basal neoplasm has compressed and more or less involved the structure. In one of these cases, admitted to the hospital by Dr. H. M. Thomas, a chondro-fibroma had grown through the floor of the middle fossa; in the other, a patient from Dr. Schmidt of Montreal, an endothelioma had originated near the ganglion. In both instances two operations were necessary, and in each case the ganglion was successfully removed, together with all visible local disease at the second sitting. Although these cases do not properly belong to this series, they served to furnish additional data which has been incorporated in the anatomic section below.

SUMMARY OF CASES.

Some particulars of these cases may be best brought out by summarizing data gathered from the individual histories.

The average age of the patients at the time of operation has been about 51 years: seven of them were over 60 and the oldest 73. Not to speak of his arteries, man is as old as he looks and feels, and were appearances to be relied on certainly fifteen years would have been added to the average age of these unfortunates in their neuralgic era. The prematurely gray head and toothless gums of most cases may, in a measure, account for this. Actual age, however, as Horsley has emphasized, is no bar to the operation; four of his cases were over 80. The average age at onset of the pain has been 41 years, the neuralgia having started in four cases during the second decade and in one case at 23 years. The youngest case operated on was 32.

Fifteen out of twenty have been men, possibly as the weaker sex has less often been allowed by friends or physicians to take the surgical bull by the horns; for the malady is supposed to be more common in women, though Bernhardt's opinion is contrary. In Krause's series there were 18 women and 7 men.

In twelve out of the fifteen cases in men, the right trigeminus has been involved; four of the five in women have been left-sided cases. It is possible that for this reason more complications have arisen in the latter group than in the former, for I have found a left-sided operation invariably more difficult and bloody than the right and, for me, the procedure on this side is somewhat more awkward.

Ten out of the series had had all of their teeth extracted; in others either the upper or the lower quadrant on the side involved (depending on the original distribution of pain) or both were found bare of teeth. Those in which the ophthalmic division was primarily attacked were more likely to have escaped this unfortunate measure. Of unilateral grayness I have seen only one case, though another (Case 12) gave a history of having become quite white on the neuralgic side (left) long before the hair on the opposite side began to change. This was primarily a supraorbital case and it is very remarkable that natural pigment has now, fifteen months later, returned, in large measure, in the hair of the beard and scalp, so that he looks like a much younger man.

It will be seen that I have not in all instances adhered to Krause's original dictum, that only those patients should be subjected to the ganglion operation in whom peripheral neurectomies had previously been

given a trial. This, in general, is a safe rule, since it is impossible to foretell whether a simple neuralgia, involving only one or possibly two divisions, will eventually resolve itself into a true "neuralgia quinti major." Many of these moderately severe cases, even should they prove resistant to other and less radical forms of therapy, may be given sufficient relief by peripheral operations, which are absolutely free from all risk. If the condition, however, has advanced to its maximal stage, with involvement of all three divisions, it is only putting off an evil hour for the surgeon to temporize on the outskirts; the seat of war must ultimately be invaded. Krause has himself made exceptions to this rule, and in the above series, Cases 10, 12, 13, 15, 16 and 18 were operated on with no preliminary delay. Others, as Cases 1 and 2 for example, would have been much better off had the ganglion been removed early in the course of the malady, but this naturally could not have been foretold. And no surgeon would be willing to subject a young individual to the hazard of the operation merely on the probabilities of a life of pain. In three instances the ganglion was removed in cases which seemed to be rapidly approaching the major stage, but in which symptoms had as yet indicated participation in the disease of only two divisions. One of these had had no peripheral operations (Case 13) and has proven a most satisfactory case. The other two (Cases 5 and 19) each had symptoms in the second and third divisions alone; each had had two earlier neurectomies, and circumstances led me to remove the ganglion. The remaining cases all had had peripheral operations from two to eight in number, and at the final admission the territory of all three divisions of the nerve had become almost equally involved in pain during the paroxysms.

The neuralgia originated in eight instances in the periphery of the third division (*N. mandibularis*), usually in the teeth; in five instances in the second (*N. maxillaris*); and in six, in the supraorbital territory (*N. ophthalmicus*). In one instance, the second and third divisions were almost simultaneously involved at the onset. It is important to note that the divisions of the ganglion as the disease progresses are involved in sequence; that is, from the third, to the second, to the first, or in reverse order, or when the onset is in the median group of cells, then the first or the third become secondarily invaded. The disease never jumps, for example, from the third to the first, or vice versa: it is an extension disease, and the anatomic location of the separate groups of cells in the tripartite ganglion explain this manner of involvement.

Peripheral operations should certainly be limited to non-mutilating procedures. It is better to attack the ganglion early than to subject patients to extensive extracranial procedures directed toward severence of the main trunks at their foramina of exit like Carnochan's operation on Meckel's ganglion. There may be exceptions to this rule, and personally I regret not having made a provisional Kocher operation on the mandibular branch in Case 5. By proper manipulation, through simple peripheral incisions, the supraorbital and infraorbital nerves may be removed occasionally in their entirety, and through a trephine opening on the ramus of the inferior maxilla, or by an intrabuccal operation a considerable portion of the inferior maxillary or lingual nerve may be evulsed. On comparatively few occasions have I performed extracranial neurectomies, and then only through a straight incision within the hair margin. There is great variation from case to case in the length of subsequent relief. After the first peripheral operation, two years or more of respite may be expected, a period which unfortunately shortens after each operation, as is commonly known. Care must be taken that the incisions, especially about the eye, be not so placed as to cause any degree of ectropion or weakness of the orbicularis, since such a sequence may jeopordize the safety of the eye in case the ganglion be subsequently removed. When sensation begins to return in the anesthetic areas after these outside procedures, indicating the almost inevitable regeneration of the nerves, there are often attendant discomforts. A condition of "*hyperæsthesia dolorosa*" supervenes, which may make the patient miserable from apprehension even before the true neuralgic pains return.

The most pitiable cases are those in which the tongue and palate are acutely involved for in some, even severe cases, the pain may be largely "outside," and the intrabuccal discomforts relatively mild. In the latter and more fortunate subjects, food, when it has once passed the lips, may be swallowed with little hesitation and talking, except for the labials, is not always difficult. The palatal cases, on the contrary, are usually the emaciated, the drooling patients, since every act of deglutition serves to inaugurate a paroxysm, and swallowing is postponed as long as possible. I have seen two individuals who preferred to take their nourishment while writhing in an exacerbation of pain which the act of swallowing could not intensify. It is more common, of course, to see them slip a spoonful of liquid nourishment into the sound corner of the mouth immediately on the cessation of a paroxysm and stealthily swallow it. These are the ravenous convalescents; those that rapidly put on flesh.

A perusal of the histories will show that eight of these patients (Cases 1, 2, 3, 6, 7, 8, 12, 16) presented in varying degree the most extreme type of the malady. In some of them, immeasureable suffering, of which we may form no opinion, had entirely broken down their self-control, so that from drugs and pain and exhaustion they were more like maniacs than persons properly at large. One of them (Case 16) was operated on as an emergency a few hours after her admission, as her screams disturbed the entire hospital; another like a crazed man in a cell had to be guarded the night of his arrival, as he had reached the end of his rope and threatened suicide if we would not operate immediately and kill him ourselves. Fortunately, such harrowing cases are rare. Other individuals with exceptional fortitude keep themselves more under control, perhaps even at work, though having, as John Donne has said, "such a pain as a constant man is afraid of and yet ashamed of that fear of that sense of pain."

One thing which particularizes the agony of these neuralgic paroxysms and which distinguishes it from other kinds of suffering is the vivid memory of its exact character which long remains. Suffering of other and milder kinds makes no such permanent and indelible impression. Acute though the memory of it remains even for years, happily, the subjective apprehension of its return soon goes; usually it is gone on recovery from the anesthetic, though this is not an invariable rule. One touching scene comes to my mind when, on the day following the operation, the patient's wife came into the ward and to the bed, took his hand and leaned over to kiss him. He involuntarily shrunk away before accepting the greeting, and apologizing, said, "she has not touched my lips for over two years." Though appre-

hension may thus linger, pain itself after ganglion extirpations immediately ceases, differing greatly in this characteristic from the effects of peripheral operations, after which the paroxysms, though in ever-diminishing severity, may persist for a few days.

POSTOPERATIVE COMPLICATIONS AND SEQUELÆ.

In consideration of their previous state of illbeing, their condition of malnutrition, their more or less protracted dependence on narcotics, together with the strain of a serious and more or less bloody operation, the majority of these cases have a remarkably uneventful convalescence. The demand for opiates, as a rule, ceases immediately when the need for them is withdrawn. This, however, is not always the case. Two of these patients—one with the most severe (Case 16), the other with a relatively mild type of the disease (Case 5)—have persisted in the use of the drug since the operation. The former patient, a "morphinist" for several years before the onset of the neuralgia, exhibited all the waywardness and capriciousness so vividly described by Clifford Allbutt[31] as features of the "moral anesthesia" produced by a long continuance of the habit.

The incision in 8 cases has been closed without the insertion of a drain. No wounds heal more kindly and with less visible scar than these temporal ones if care has been taken to carefully approximate the edges. In the remaining cases a small drain, usually of protective, has been placed in the auricular angle of the incision. A drain is undesirable if it can be avoided, since there are apt to be attendant discomforts, headache, backache and other ails during the days immediately following the operation, particularly if there is a considerable escape of cerebrospinal fluid.

I have been especially interested in the location of the intracranial discomfort in these cases, and have commented on it elsewhere.[30] The majority of the drained cases, one or two of the others, have complained for a few days of headache, which, with one exception, has been hemicranial and confined to the sound side. The exception (Case 19), a very bloody and difficult case, in a woman, proved to be an incomplete extirpation, and subsequent examination established a partial sensory return in the region of the ophthalmic division soon after the operation. In this patient the headache was bilateral. The observation would seem to speak in favor of a dural origin for intracranial pain, for the trigeminal neurectomy serves to render anesthetic the meningeal, as well as the mucous and cutaneous areas of trigeminal distribution on the side of the operation. With the exception of the area about the foramen magnum (pneumogastric supply), the entire dural membrane, the tentorium included, is innervated by the trigeminus, and it is tempting to speculate on these lines as to the relationship between pre-existing migraine or hemicrania and the subsequent neuralgia into which the former not infrequently develops. It is quite possible that this form of hemicrania may indicate a morbid process of the dural nerves, precisely akin to that which we more commonly associate with the cutaneous periphery, a process which finally extends to the ganglion, and in the course of time may involve its facial branches.

In two patients the convalescence, otherwise uncomplicated, has been interrupted by an outcrop of herpes, the unusual features of which have been the occasion of another paper.[28] In one case (Case 3), on the tenth day, and in another (Case 17), on the seventh day, an eruption of what ordinarily would have been considered a well-developed herpes facialis developed about the nose, lips and cheek. The area of anesthesia resultant to the ganglion extraction, however, remained absolutely free from vesiculation, although in one case it was quite surrounded by the herpetic outcrop. The observation, together with Howard's[32] finding that ganglion lesions accompany the labial herpes of pneumonia, points strongly toward a ganglionic origin for herpes of this type, as well as for the true zoster. Curiously enough, both cases gave evidence of a concomitant lesion in the lower sacral posterior-root ganglia shown by a symmetrical area of tenderness and hyperesthesia, which in one case went on to a unilateral vesiculation of the perineum; the other, having stopped short of the cutaneous lesion, was looked on as a zoster without eruption, which, as Mackenzie has pointed out, may be a not uncommon malady. Herpetism as a disease is well worthy of further study. Happily, neither of these cases has suffered from a subsequent post-zoster neuralgia; this would have been a sad tax to have levied on one who had already paid high with pain.

Stiffness of the jaw, of greater or less degree, usually appearing a few weeks after the operation, is a common sequel of the operation. Though ascribed by some to the proximity of the operation to the inferior maxillary joint, a much more probable cause is the shortening of the atrophied temporal and masseter muscles due to the fibrous change which they undergo. In one patient (Case 7) as a result of an operation on Meckel's ganglion, the temporal muscle had been paralyzed with a resultant stiffness of the jaw which prevented the separation of the teeth for more than 2.5 cm. In this case during the ganglion operation the maxillary joint was inadvertently opened and it was feared that even a greater disability would result than before. Quite the contrary took place, and despite the injured joint, the division of the fibrous temporal muscle sufficed to free the jaw so that a much wider opening has been possible since than before. Though only occasionally a troublesome feature of the early postoperative period, the contracture may at times be so great that patients must be encouraged to frequently wedge the jaws open in order to stretch the shortening muscles. Were it a serious or a more frequent complication, it might be advisable during the operation to sever the temporal muscle at its attachment to the coronoid process. Excision of the zygoma serves the same purpose, so far as the masseter is concerned, and this custom may account in a measure for the rarity with which patients in this series have complained of lack of ability to widely open the mouth. Instances of temporo-maxillary anchylosis have been reported, a sequel presumably due to sepsis. Wound infection, fortunately enough, has not occurred in our series.

The Condition of the Eye.—Of importance above all others are the post-operative ocular complications, which, since the first attempts to remove the ganglion, have been a great cause of concern to the surgeon and an equal source of interest to physiologists. It has been shown, alas, too frequently, that from one cause or another an enucleation of the eye may eventually be necessary, and it consequently is wise to have

31. Allbutt: System of Medicine, vol. II, 1897, "Morphinism."

32. Howard: Amer. Jour. of the Med. Sciences, 1903, vol. cxxv, p. 256.

an understanding with patients and friends that relief from pain may demand this sacrifice. The patient rarely hesitates, if his neuralgia be of the major kind. Twice in this series enucleation has seemed advisable owing to what promised to be loss of visual function, though the eyeball itself might have been saved in each instance. The whole question of trophic control over the globe, supposed, according to Gaule, to be exercised by the ophthalmic division of the trigeminus, remains a somewhat confused one. It is commonly advanced as an argument, in favor of fractional removal of the ganglion, that preservation of the first division alone assures with any certainty the safety of the eye. This statement needs reservations, and I think is true only in case the ophthalmic division with its group of ganglion cells is left absolutely intact; if traumatized or injured in any way during the operation—and this is often unavoidable—its extraction, when that is possible, is much less likely to lead to harm than its attempted preservation. One is constantly impressed with the force of Dr. Weir Mitchell's statement that so-called trophic disturbances, whatever they may be, are not due to complete withdrawal of trophic control, as, for instance, by the complete severance of a nerve, but rather to interference with its normal function due to a partial injury and resultant irritative conditions. One of the patients (Case 19), whose eye became seriously inflamed after the operation, was a case in which, as the return of sensation in the forehead and eye showed, I did not completely remove the first division. In the cases of total extirpation, as a rule, no such disturbance has occurred. Neuroparalytic keratitis, as the simple result of the ganglion extirpation, need never occasion anxiety if proper precautions are taken to guard the eye, particularly for the few weeks succeeding the operation. Without entering into the controversy of trophic vs. non-trophic nerves, it may be said that our clinical experiences are thoroughly in accord with the experimental work of Hanau,[33] whose conclusions are that all changes of the cornea after trigeminal paralysis are only consequences of external influences on the eye, unprotected through its loss of sensibility, and that this applies as much to the slight initial lesion, an especial consequence of dryness, as to the extreme degree of keratitis (*der groben Nekrose*). Similar conclusions resulted from Turner and Ferrier's investigations, which showed that when the eye was protected, intentional wounds of the cornea in rabbits would heal as readily after section of the trigeminus as under normal circumstances. Pain of itself is, of course, a conservative provision of nature. Analgesia removes this protective agency, and especially in such a delicate structure as the eye with its poor circulation, a slight injury due to the presence of a foreign body, an eyelash, for example,[34] or the slight pressure of a dressing, etc., may pass unnoticed, and an ulcer or an infection be the result. One patient (Case 10), an oysterman, a few weeks after his operation, was on the water for a whole day in the bright sun with his eye unprotected, and a slight conjunctivitis was started up. This was treated by an ophthalmologist who, not appreciating the significance of the anesthesia, applied a cotton dressing under the usual four-tailed eye bandage. The eye remained open under the dressing, which in twenty-four hours had rubbed off the epithelium and produced a loss of substance in the cornea. Fortunately, the case was seen on the following day, and under a watch glass, with irrigation, the ulcer rapidly healed, leaving a slight opacity which, luckily, remains at one side of the pupil. He has had no trouble since, but is careful to wear dark glasses when exposed for any length of time to bright sunlight.

All who have had considerable experience with the ganglion operation have emphasized the fact that inflammatory disturbances are most apt to ensue when peripheral operations, perhaps repeated many times, have been carried out in the neighborhood of the eye. The scars resultant to these operations may in two ways lead to difficulties after ganglion extirpation. One of these, as Case 11 illustrated, is a lagophthalmos brought about by the juxtaposition of the ganglion incision, to the scar of an old infraorbital one, a combination which may serve to divide all the fibers to the orbicularis. Reunion of the fibers luckily took place in this instance, and it is interesting to note that a pressure palsy of the third nerve in this same case with consequent ptosis served to keep the eyeball covered with an immovable lid in spite of the temporary paralysis of the orbicular muscle. As Kocher and Krause have emphasized, it is important in all infraorbital operations not to make the incision parallel to the lower margin of the orbit, but obliquely and parallel to the facial fibers; the more so, since in this way another serious deformity, namely, a cicatricial ectropion, is thus avoided. It was a condition of this sort, added to inexperience in the treatment of the eye (no Buller shield was used) which led to the loss of the globe in one of my earlier patients (Case 4). A chronic conjunctivitis (trachoma), in addition to the ectropion, had long existed in this patient, had been untreated for years, owing to the great sensitiveness of the eye, and after the ganglion operation ulcers would form, and heal and reform, until finally it was deemed best to enucleate the eye, as the patient lived in a remote corner of the state where she could not be under observation.

There are many ways of safe-guarding the eye during the operative and postoperative periods. Sir Victor Horsley, Keen and others commend sewing the lids together either during the operative period alone, or for a few days subsequent to it, a procedure which the laboratory experiences would favor. This advice I have followed in one case without the conviction that any advantage attaches thereto. During the operation the eyes are covered with a broad piece of thin rubber protective, in order to prevent any possible irritation by ether fumes, and also carefully covered during the skin preparation to prevent the chance entrance of soap or of antiseptics. After the operation I have come to depend entirely on a Buller shield which, though originally devised for a different purpose, nevertheless possesses advantages which Dr. Keen has already emphasized; a large watch glass being used whose edges are covered with a circular ring of adhesive plaster so as to completely shut out the air. This protection should be worn for ten days or longer after the operation, the length of time depending on whether the conjunctiva remains reasonably free from injection after trial exposures; then worn only during the day, and finally discarded entirely. I always insist, however, on its being reapplied at any time during the first month

33. Arthur Hanau: *Experimentalkritische Untersuchungen über die Ursache der nach Trigeminusdurchschneidung entstehenden Hornhautveränderungen*, Zeitschrift für Biologie, 1896, vol. xvi, p. 146.

34. Noteworthy in this connection is the fact that as an early consequence of the neurectomy the lashes become very much loosened and are shed in considerable number. I have not seen this commented on.

or six weeks, when there is a greater likelihood than usual of conjunctival irritation from exposures of one kind or another, for example, during the journey home on a dusty train. A daily irrigation or not, according to the presence or absence of secretion, is advisable; otherwise nothing is needed. The chief object of this glass protection is to "hot house," so to speak, the eye and to insure moisture for the conjunctiva. Whatever may be the physiologic interpretation of the nervous control of lachrymal activity, there is undoubtedly for several days after a total extirpation an insufficient secretion of tears, and if the eye is not kept moist, the movements of the lids in winking or of the eyeball under them must rub and inflame the unlubricated membrane. This results in loss of the surface epithelium, which may lead to infection and ulceration, even when there has been no traumatism by a foreign body. It is gratifying that in all but three of the cases in this series there has been no inflammatory reaction whatever, and the anxiety lest it occur ceases in large measure with the resumption of normal glandular activities after the first two or three weeks. Krause observed in his cases a lessening of lachrymal secretion which Köster, who believes that the gland is activated by fibers from the facial through the great superficial petrosal, attributed to a probable injury of the latter nerve during the operative procedure. Wilbrandt and Sänger,[35] however, concluded an extensive review of the subject, with an expressed belief in the possibility of a variable nerve supply, by the facial, the trigeminus or the sympathetic alone, or by a combined action of all three together. Inasmuch as the secretory activity returns in large part, if not entirely, to its normal condition, and since regeneration of the fifth is impossible and injury of the superficial petrosal quite improbable in the operation above described, I have been inclined to ascribe the lachrymal disturbance entirely to severance of the sympathetic fibers, which in the complete extirpation are almost necessarily divided. It may be noted, in connection with the sympathetic paralysis, that in eight of the cases in this series there existed for some weeks a post-operative pupillary contraction, often noted at the close of the operation, and in many of them a slight though evident enophthalmos with narrowing of the palpebral cleft. The contracted pupil after a few days does not dilate with cocain, evidencing, according to Schultz, that the degeneration of the postganglionic fibers has reached the dilator muscles. With regeneration, as I have supposed, of these traumatized or divided sympathetic fibers, lachrymal secretion returns, the pupil regains its normal size and the enophthalmos, if it has been observed, disappears.

Oculomotor palsies have occurred with great frequency when the effort to remove the ganglion *in toto* has been successful, as may be seen by consulting the case-reports of those who thus deal with the structure. Fortunately, these paralyses are from pressure injuries, and are only transitory affairs. My personal record is as bad as it can well be, for in only four of the patients were there no postoperative palsies of any sort (Cases 3, 18, 12, and 19), and of these it will be seen that the last two were cases in which I did not succeed in entirely removing the cells of the ophthalmic division, as the early return of sensation in its cutaneous area demonstrated.

The commonest sequel has been an injury of the abducens, which is naturally accounted for by the anatomic proximity of this nerve to the upper edge of the ganglion. In eight cases of total extirpation there has been a resultant palsy, varying in intensity from a weakness which clears up in a few days to a marked internal strabismus, recovery from which has taken twelve weeks. It has never been a permanent lesion. In all of these eight cases the pupil has been contracted immediately after the operation, and has remained so for an indefinite period (weeks, months, and in one case, I believe, it has continued contracted). It reacts to light and to accommodation, contracts when eserin is dropped in the eye, dilates under atropin, but does not dilate with cocain, at least for the first few weeks after the operation. Krause's (1896) report stated that there were no postoperative pupillary changes whatever in his cases. On four occasions (Cases 5, 6, 9 and 16) there has been, in addition to the paralysis of the abducens, a slight palsy of the third nerve which has lasted only a few days. The pupil in these cases has also been somewhat contracted. Three times has the third nerve been injured alone (Cases 11, 14 and 20), twice severely with a dilated and immobile pupil, and once slightly. It was interesting to note, in the latter cases, that during the period of two weeks, when only the external rectus and superior oblique muscles functionated, in other words, when the third paralysis was seemingly complete, the pupils were the same size, reacted equally well to light, directly and consensually, and to accommodation. This would lend clinical support to the view that the ciliary ganglion is the chief reflex center for the iris, and that the third nerve may, under certain circumstances, be severely injured without affecting its activity.

In concluding this section, it may be pointed out that in the above series of cases there have been instances of ganglion extirpation, both with and without accompanying sacrifice of sympathetic fibers; instances of third nerve lesion with ptosis, so that the upper lid served to cover and protect the eye during the critical few weeks after the operation; and two instances of lagophthalmos, one transitory, the other (one of the tumor cases in which there was also a paralysis of the facial nerve) permanent, so that the cornea remained continually uncovered; finally, instances, one of corneal hyperesthesia and one of hypesthesia, due to only partial removal of the ophthalmic division—lesions, in fact, representing almost every combination claimed by one or another investigator as responsible for the production of neurotrophic keratitis, and yet in only one case (Case 4) of pre-existing ectropion with inadequate lid closure, a case in which no glass shield was used to keep the eye protected and moist, did a serious keratitis supervene. From the clinical experience, therefore, one very naturally inclines to the view that purely traumatic influences (as instanced in Case 10) or the combination of corneal dryness with infrequent (xerotic theory), or incomplete closure of the lids, alone play a part in the causation of corneal inflammation, and that the pure trophic, the tropho-traumatic, and the vasomotor palsy theories are hardly tenable.

35. Die Neurologie des Auges, vol. II, Wiesbaden, 1901.

Digitalis produces its good results by causing slower contractions of the muscular tissue of the heart, thus giving that organ more rest and nourishment. If you remember this, says Clemsha, in *Medical Council*, you will expect but very little from a worn-out heart, with marked degeneration of its muscular walls.

FLUORESCENCE ARTIFICIALLY PRODUCED IN THE HUMAN ORGANISM

BY THE X-RAY, BY RADIUM AND BY ELECTRIC DISCHARGES, AS A THERAPEUTIC METHOD.*

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The therapeutic method outlined in this paper and in previous publications consists in the saturation of the human organism in whole or in part with a medicine endowed with the property of fluorescence (or phosphorescence), and in then submitting this patient to the action of *x*-rays or of the radium radiation or of high-frequency currents. It is, therefore, a combined treatment. I have termed it artificial fluorescence.

The sum total of my object was to develop light within tissue in the confidence that the well-known external effects of this agency might now be duplicated internally and especially in the expectation that certain wave lengths of the visible spectrum, like the blue-violet and the yellow-green, might exert specialized effects. But it is also obvious that the wave lengths of the visible spectrum can not be reasonably supposed to be the sole output and resultant of the absorbed energy of the *x*-ray and of the radium radiations. Effects, therefore, may be attributed to transformations into other wave lengths, as, for instance, the ultra-violet or even into the well-known secondary radiations, lower in wave length than the *x*-radiations, but still akin to them in their property of not being refracted and dispersed as are the violet and ultra-violet. These secondary radiations in their turn set up fluorescence.

The main point is that by reason of the medicine administered to the patient a new set of radiations is set up within his tissues, and that the most obvious of these radiations is light itself or closely akin to it.

In science it seldom happens that ultimate truth is arrived at all at once. Usually prior observations have preceded, a great number of experiments have followed, a final deduction has been made, and this itself may after all turn out to be wrong.

So it is regarding the subject of my paper, but certain it is that artificial fluorescence by radium and the *x*-radiations is founded on a solid physical basis, applicable to living human beings, and that the clinical results obtained at least increase the percentage of cures in many diseases.

HISTORY OF RESEARCHES.

The steps leading up to the plan here presented of treating the entire blood system with a fluorescent substance and then submitting it to *x*-rays and to radium radiations are few but most interesting. They relate to a local use of the fluorescent substance by hypodermatic injections or by topical applications, and to the use of the Finsen light as an excitant. With these methods, I have had no experience, since my object has been not alone to affect superficial skin areas as in lupus, but rather to affect deeper areas like cancerous tumors, tuberculous glands and tuberculous lungs, carcinoma of the stomach, and chronic diseases like malaria or general conditions like pseudoleukemia. To accomplish this purpose, the medicine to be administered by the mouth must be harmless, but also fluorescent, and a radiation must be used which is able to excite fluorescence deep within the tissues. Obviously, the Finsen light radiation would not furnish the penetration required and topical administration would not reach the diseases desired. I therefore resorted to the Roentgen ray and to radium.

NATURAL FLUORESCENCE OF TISSUES OF THE BODY.

In 1845 Professor Brucke stated that the crystalline lens of the eye was fluorescent and the aqueous humor less so. In 1855 M. Jules Regnauld, using sunlight, found that the cornea fluoresced slightly, the crystalline lens highly, and the vitreous humor less so. In 1895 Setschenow of Moscow, in a series of careful experiments, corroborated these results. He observed that when the eye is brought into the focus of the ultra-violet rays, immediately the cornea and the lens begin to glimmer with a white-blue light. Dr. Henry Bence Jones[1] not only repeated these experiments on the media of the eye, but also, as a result of careful researches, made the very remarkable discovery that man and all animals possess in every part of the body a fluorescent substance resembling quinin. This substance he found to be an alkaloid and to be closely related to quinin. He named it "animal quinoidin." He found that this animal quinoidin was present uniformly in extracts of the liver, heart, spleen, lungs, kidneys, brain, nerves, muscles, cartilages, blood, bile and humors of the eye. The fluorescent substance did not disappear from lenses that had been kept for months in glycerin.

Using a spark from a Ruhmkorff coil as a source of light, Jones determined distinct fluorescence in a solution of one grain of quinin to 1,000,000 parts of water.

Dr. Chalvet[2] found that Dr. Bence Jones' fluorescent substance exists in various foods and even in wine, and is, therefore, probably not of an animal but vegetable origin.

In 1858 Drs. Edward Rhoads and William Pepper published[3] a "Contribution Toward Our Knowledge of the Pathological Changes in the Fluorescence of the Tissues." They confirmed Bence Jones' results, and then advanced the original idea, based on an examination of the blood in a number of cases, that "a close connection exists between the diminution of animal quinoidin and malarial diseases." They therefore gave quinin to increase the fluorescence of the tissues to its normal point.

In 1900 Dr. A. F. A. King[4] of Washington, D. C., resurrected these publications of Bence Jones and of Rhoads and Pepper, in connection with his theory and suggestion of placing malarial patients in the dark or in rooms with violet or purple window hangings. Dr. King bases his suggestion on his belief that the sporulation of the plasmodium of malaria can not take place in the dark, but only in light and more especially in red light. This treatment corresponds, of course, to the red light or Finsen treatment of smallpox.

In 1900 Professor von Tappeiner[5] in conjunction with Dr. O. von Raab, tested the action of the fluorescent light of phenylacridin on infusoria. Paramecia in an acridin solution of 1 in 20,000 died in sunlight in six minutes, in diffused daylight in about sixty min-

*Read at the International Electrical Congress of St. Louis in Section H, Electrotherapeutics, 1904.

1. Proceedings of Royal Society, April, 1866, and "Lectures on the Application of Chemistry and Mechanics to Pathology and Therapeutics," London, 1867.
2. Gazette Hebdomadaire, second series vol. v, 1868.
3. Pennsylvania Hospital Reports, 1868.
4. Vermont Med. Monthly, June, 1902.
5. Münchener med. Wochens., 1900, No. 1.

utes, but if kept in the dark they were alive after 6,000 minutes, viz., after 100 hours. Von Tappeiner summarizes the results of his and von Raab's experiments as follows:[6] "Light becomes highly injurious to paramecia in the presence of acridin, phenylacridin, eosin and quinin in solutions in which these substances in themselves (in the dark) are hardly, if at all, poisonous. This action of light is closely connected with the fluorescent quality of the substances named. The injurious power, however, lies not in the fluorescent light produced, but in the process of its production."

O. von Raab surmises that we have here a conversion of the energy of the light rays into chemical rays analogous to that of chlorophyl, which is also a fluorescent body, but with this difference, that this conversion is the cause of death to the paramecia, whereas to plants it is the condition of continued life.

Von Tappeiner holds that this kind of light action comes into play with those animal organs, skin, retina, blood and lymph serum, which have the capacity for fluorescence. He surmises, too, that the cause of the skin inflammation noticed by Wedding, in beasts fed on buckwheat, lies in the fact that substances get into the body which are capable of fluorescence.

Von Tappeiner concludes his article with the suggestion that fluorescing substances, by being applied to the part and subjected to light, may be employed in dermatology, just as eosin and other fluorescing substances have been empirically employed for the last ten years in photography as "sensitizers."

In 1901 H. Lieber of New York made experiments with agar agar solutions inoculated with common mold and further experiments with grape and other fruit juices, and found that fluorescent substances, like solutions of fluorescin, eosin or rhodamin, arrested fermentation in every case so long as the solutions were exposed to daylight, but that the fluorescent substances had no perceptible effect on the solutions when kept in the dark. These principles he applied to the preservation of foodstuffs.

In June and August, 1903,[7] and later on, I[8] published a plan of saturating the entire system by administration of fluorescent medicines and submitting parts or the whole of it to *x*-rays and radium radiations, after, however, recording a series of experiments on patients from January, 1900, onward. In November, 1903, was published[9] the experiments of Dreyer on "Light Treatment" by the method of "sensitizing" tissues, already suggested by von Tappeiner. This article, brief but most interesting and important, was a résumé of a report of investigations made to the Danish Academy of Sciences in April, 1903. Dreyer adopted the plan which has long been used in sensitizing photographic plates of adding to the bromid or chlorid of silver solution certain substances which are generally of a fluorescent nature. Infusoria, bacteria and animal tissues thus impregnated and submitted to the action of the Finsen light were affected by the green to orange rays exactly, as without the use of the sensitizing agency they would have been affected by the ultra-violet rays. The importance of this plan is evident, for it is the red to green rays of the arc lamp which easily penetrate tissue, while the ultra-violet penetrate but very slightly. By the Dreyer sensitizing method the scope of the Finsen treatment for lupus, etc., would be greatly extended and simplified, the effect would extend more deeply, the area be more extensive, and the pressure device be unnecessary. Dreyer used principally erythrosin in a solution of 1 to 4,000, a solution perfectly non-toxic, except under the influence of the arc-light radiation.

The following table is most instructive. Using a 30 ampere lamp, a quartz and water-cooled vessel, and erythrosin, different rays of the spectrum were tested. Micro-organisms were killed in the time and under the conditions given below:

Color filter used.	Acting rays.	Infusoria.		Bacteria.	
		Sensitized.	Normal.	Sensitized.	Normal.
Quartz.	Entire spectrum ultra-violet.	10 sec.	100 sec.	60 sec.	80 sec.
Glass.	Visible spectrum.	10 sec.	9 min.	10 min.	10 min.
Solution, nickel sulphate.	Red-orange, yellow, green, blue.	10 sec.	13 min.	10 min.	10 min.
Blue glass, monochromic.	Red, orange, yellow, yellow-green.	10 sec.	70 min.	15 min.	Over 4 hours.
Acid potassium, double chromium.	Red, orange, yellow-orange.	10 sec.	110 min.	25 min.	Over 9 hours.

The above table shows that it is the yellow-green rays to which the micro-organisms are rendered sensitive.

Dreyer also sensitized animal tissues by hypodermatic injections of erythrosin, so that the yellow rays, otherwise without effect, would now cause an inflammatory reaction such as is caused by the violet and ultra-violet rays.

Professor Neisser and Dr. Halberstaedter[10] review and amplify the work of Dreyer. Neisser makes the following remarks as to the cause of the action:

1. The occurrence does not depend on fluorescence, because there are sensitizing materials which do not fluoresce, and fluorescent materials which do not sensitize.

2. The occurrence does not depend on the absorption of certain rays, because there exists a number of fluorescing and non-fluorescing materials which absorb the same rays as erythrosin, and yet do not sensitize.

3. The process can not be accounted for by the formation of toxic substances in the sensitizer during the illumination, because if one first subjects a sensitizing fluid to light, and afterward puts micro-organisms into the fluid, these germs are not killed.

Jesionek[11] discusses the therapeutic applications of fluorescent substances in various diseased conditions after the method of Tappeiner just referred to. The skin was painted with solutions of fluorescent substances and then submitted to sunlight, concentrated by lenses or not. A solution of eosin was most commonly employed. In cases of carcinomatous growths parenchymatous injections of 0.1 to 0.01 per cent. solutions were used.

In July, 1904, [11 1-2] Gunni Busck advocated exposing malarial patients to whom quinin had been first administered, to sunlight, on the ground that quinin causes micro-organisms to be sensitive to light. I had already considered the possibility of this plan in my first publications and wrote: "As to sunlight as an exciting cause of fluorescence, it is to be noted that light passing through a red screen, as, for instance, the blood, fails

6. Quoted from Freund, p. 519.
7. Electrical World and Engineer, June 20, 1903; Med. Record, Aug. 8, 1903.
8. New York Med. Journal, Feb. 13 and 20, 1904.
9. British Med. Jour., November, 1903.
10. Deutsche med. Wochens., Feb. 18, 1904.
11. Münchener med. Wochens., May 10, 1904.
11½. Amer. Jour. of the Med. Sciences.

to excite fluorescence, while the *x*-rays and radium radiations readily penetrate this screen."

On the whole, the fact is well established that quinin solutions when subjected to light exert a deadly influence on some micro-organisms. Ullman has found that paramecia placed in solutions of quinin of 1 to 20,000 die only after standing about five hours in the dark, while they are killed in the course of eight minutes, if placed in sunlight, and under conditions which usually have no deleterious influence on the paramecia.

WHAT IS FLUORESCENCE?

Fluorescence is the property which substances have of absorbing invisible or visible rays and giving out visible light. The fluorescent substance does not give out the same wave length as that which it receives. According to Stokes' law, it should give out a wave length of lower frequency, namely, the shortest wave length of the fluorescence spectrum is always of less refrangibility than the longest wave length capable of exciting fluorescence. Lommel[12] has shown, however, that solutions of fluorescin, eosin and naphthalin red do not conform to Stokes' law, and Nichols and Merritt,[13] in recent investigations, show that rhodamin, resorcin blue, quinin, chlorophyl and esculin also do not even approximately conform to this law. The fluorescence of quinin sulphate appears to be independent of the wave length of the exciting light.

Fluorescence and phosphorescence are much akin. The former lasts only so long as the exciting cause is maintained; the latter endures after the excitation has ceased. Substances like willemite exhibit both properties. According to Becquerel, fluorescence is only phosphorescence of short duration.

Sunlight, electric discharges, ultra-violet, the Roentgen and Becquerel rays, all excite fluorescence and phosphorescence. It is precisely these rays whose biologic effects are now under discussion therapeutically, and the very pertinent question arises, Is not the now familiar and ordinary curative effect of these various rays due to their common property of exciting fluorescence or even phosphorescence? Or, put in a broader sense, is this curative effect not due to secondary radiations, invisible, as well as visible?

That the effects of the *x*-ray may be due to the fluorescence of the tissue elements themselves is an opinion I have long held and expressed.[14] This opinion is also guardedly put forth by L. Freund in his incomparably excellent book on radiotherapy, page 336. He says: "It seems, moreover, not impossible that *x*-rays induce fluorescence in those tissue elements capable of this phenomenon, and that this process brings about chemical changes, especially in the cells. In this respect those tissues which contain earthy matter would appear to possess some affinity to the bromid of silver gelatin, while other tissues which have no fluorescence capacity remained unharmed by the rays."

Goldstein[15] argues that since Roentgen rays, when they impinge on bodies, produce ultra-violet rays, of very short wave length attributes to this ultra-violet light those biologic effects produced in the deeper layers of the skin by Roentgen radiation.

Freund combats this view on the ground that biologic effects are not produced in internal organs, heart, liver, etc., where the Roentgen rays equally penetrate.

12. Poggendorff's Annalen, vols. cxliii, clx, clx.
13. The Physical Review, July, 1904.
14. Med. Rec., Aug. 8, 1903.
15. Quoted from Freund.

Many experiments on the lower animals have demonstrated that profound lesions of internal organs are produced. In my own experience I can never forget the peculiar, crispy, cartilaginous feeling of the cutting knife in a deep dissection for the radical removal of a carcinomatous breast, removed after three months of Roentgen treatment. Both the pectoralis major and minor were cornified as verified by subsequent microscopic examination.

But whether or not simple *x*-ray treatments produce in normal tissues either ultra-violet or fluorescent rays, is not the question. The possibility of such being the case is merely mentioned as constituting collateral confirmatory evidence. My method, of course, is to permeate tissues and cells with a substance known by prior laboratory experiment to be actually fluorescent and known to retain this property when in the blood, and then to artificially excite this fluorescent quality in the combined fluids. The method is positive and demonstrable apart from theoretical considerations, and its curative results are matters of clinical observation.

Certain it is, as evident by foregoing statements, that fluorescence and phosphorescence are natural properties of living animal tissues.

These two phenomena of light exist naturally in some infusoria, bacteria, insects, deep sea fishes, and, as we have seen, in the tissue of human beings. In the human being, as in the other living organisms mentioned, this fact must have a meaning, since every function or ingredient of the organism means something. It is simply a question as to whether this intrinsic phenomenon can not be artificially utilized as a therapeutic measure.

Is the specific action of some well-known drugs due to their fluorescent properties?

As already mentioned, Rhoads and Pepper, in 1866, acting on the demonstration of the normal fluorescence of the blood by Dr. Bence Jones in 1866, presented the reports of 12 cases in which they claimed that quinin cured by increasing the fluorescence of the blood in cases of fever. In these cases they demonstrated a prior diminution of the natural fluorescence of the blood.

Dr. A. F. A. King[4] of Washington, in his interesting article referred to on "Sunlight and Malaria," argues that the malarial parasite is a naked ameba, that red light promotes the vital activity of amebæ, while violet or purple restricts it; for instance, *amœba proteus* streams in the presence of red light, and ceases to stream in light from the violet end of the spectrum. The color of the light diffused through the blood is red, as one may see by holding the hand in front of a candle. Therefore, the malarial ameba, while thriving in red light, would thrive poorly or perish in light from the violet end of the spectrum. In this manner he would explain cures of malarial fever by methylene blue, by Prussian blue, and by iodin, which last becomes in the stomach purple iodid of starch, and by quinin, esculin and fraxin, all of which are "antiperiodics" in ague and fluorescent.

I would suggest another reaction which may have a bearing on the curative and antiseptic action of the salicylates.

It is well known that the salicylates give a beautiful violet reaction with peroxid of iron. Supposing that salicylates are administered medicinally, where is the peroxid to be found? In many diseases, most amenable to the action of the salicylates, there is a great destruction of the blood corpuscles with the formation of pig-

ments in the organism. According to Hugouneng,[16] all of these pigments are rich in iron. Sometimes peroxid of iron occurs, probably from the destruction of hematin, which chemically contains iron. Here, therefore, we may have another "color" explanation of the effect of the medicine administered.

Quincke[17] showed that hemoglobin gives off its oxygen more quickly in the light than in the dark. For this reason, light increases the oxidizing power of the blood and correspondingly increases the processes of oxidation. The salicylates, therefore, may promote in this manner metabolic exchanges due to the violet light set up in the blood corpuscle by reason of a combination with the peroxid of iron set free in the decomposition of the corpuscle.

FLUORESCENCE OR SENSITIZATION?

The experiments quoted of Tappeiner and Raab and of Dreyer and Halgerstaedter prove beyond question that some non-toxic fluorescent and non-fluorescent substances, under the excitation of the arc-lamp radiation, kill infusoria and bacteria and cause inflammatory reaction of tissue. This action is ascribed by them to a certain "sensitizing" effect of the same nature as occurs by the use of the same substances in photography.

What, then, is sensitization, especially in photography? The effect of light on the sensitive material of photographic plates has long been familiar, but the nature of the reaction between the ether radiation and the sensitive material is not understood. It is not enough to claim that this reaction is simply a chemical one, and say that the chlorin or the bromin of the Ag Cl or Ag Br is in unstable equilibrium and is jostled off of its molecular combination by the impingement of the radiation. This simple statement of the case is negatived by numerous objections. For instance, many substances added to the silver emulsions greatly enhance the amount of silver salts set free. Such substances are termed in photography "sensitizers." Prominent among them are gelatin and eosin. It is, for example, a curious fact that the *x*-ray will not affect a collodion bromid of silver plate. We must conclude, therefore, that instability of the silver salt is promoted by the proximity and by some action of the gelatin. What the exact action of the sensitizer is, is not yet explained by chemistry.

The commonly received opinion is that by reason of the ether impulse a part of the bromin is separated from the silver and absorbed by the gelatin, and, as throwing further light on the process, it is believed that the action of the sensitizer is to increase the capacity of the decomposed salt to absorb oxygen. On the contrary, chlorid of silver in a sealed vacuum tube, and thus out of contact with oxygen, remains unaffected after months of exposure to light. But also, silver chlorid free in the air, but unexposed to light, retains its white color. It would thus appear that both light and oxygen must be mutually present, and further, that in some unexplained manner the "sensitizer" provides the oxygen.

From this point of view, it is pertinent to recall that Sir Oliver J. Lodge has suggested that the therapeutic value of *x*-radiation lies in production of ozone within the irradiated tissue. Granting this, a tissue impregnated with a sensitizer would be richer in oxygen and we should thus simply enhance the effect of ordinary *x*-radiation. Against such a conclusion is the received fact that the *x*-ray produces no such pronounced action in deep as in superficial tissues, although it penetrates to the deeper tissues. L. Freund, as quoted, suggests that in the case of tissues rich in mineral constituents the minerals act as sensitizers.

These facts are all interesting, but they are not final—they explain without explaining, and for the present I am content to believe that in fluorescence, namely, in light, or in the invisible radiations of the same nature of ether vibration, we have a causation which is as fully explanatory of the effects in question as our present knowledge will justify. For this reason I have preferred to term the method I have advocated "Artificial Fluorescence" of living tissue. Possibly, reasoning by analogy, we may draw the deduction that just as by the intervention of the fluorescent substance chlorophyl, the all-pervading agency of light, causes a supply of carbon to the plant kingdom, so, under the influence of the same light, intervening fluorescent substances cause a supply of oxygen to the animal kingdom.

EXPERIMENTS.

Among liquid fluorescent substances may be named quinin, esculin, fraxin, eosin, fluorescin or uranin, rhodamin, cochineal, copper potassium chromate, gentian, henbane, litmus, naphthalene red, paraffin, petroleum, vaselin, stramonium, tumeric indigo, safranin, pavlin, magdala red, thallin, resorcorufin and resorcin blue, and some salicylates.

It was quickly found that while the above substances were fluorescent to daylight, a great variation in their capacity for fluorescence existed when exposed to *x*-radiations and to radium radiations. Some substances non-fluorescent to sunlight are vividly fluorescent to the *x*-ray and to radium, and vice versa. Among those most fluorescent to radium are quinin, uranin, fraxin, esculin and members of the petroleum series, like vaselin.

Experiments made with liquids in glass receptacles were valueless because the glass itself is highly fluorescent to the *x*-ray and to radium. Radium radiations are, on the whole, superior to the *x*-ray in exciting fluorescence. Many fluorescent liquids absorb the *x*-rays or radium radiations and therefore cast a shadow corresponding to the ordinary density shadow in radiography. This would seem to constitute a new sort of skiagraphy.

Applying this principle, I caused a subject, Dr. W. E. Decks, to take twenty drops of a 1 to 30 aqueous solution of uranin, and one hour later submitted the hand to an ordinary *x*-ray exposure. The negative and print obtained when compared to a control picture of the same hand under the same conditions, except as to the dosage of uranin, gave an *x*-ray picture immensely superior in detail and clearness. This was especially true of the osseous structure and would lead one to suppose that certain portions of the bony structure when saturated with uranin absorbed the *x*-ray to a greater extent than if the uranin had not been used. These pictures make an interesting addition to skiagraphy, and are here exhibited (Figs. 1 and 2).

A further interesting outcome of experimentation was the discovery of a new fluorescent liquid, fluorescing a very deep purplish blue so deep that when concentrated it appeared almost black, but a drop of it added to a test tube filled with water gave a fluorescence as blue as that of esculin. The observation arose in this man-

16. Gazette Hebdomadaire de Med., quoted from Med. Rec., July 5, 1902.
17. Quoted from L. Freund.

test: Test tubes in which fluorescent solutions of esculin were allowed to stand during one or two weeks were found, themselves, to have become intensely fluorescent after being emptied and carefully washed out and dried. Such a test tube casts a shadow on a screen or gives a photographic print as dark as ordinarily would be caused by a piece of lead one-quarter of an inch in thickness. It would seem that an esculinate of silica or a silicate of esculin had been formed. I have submitted some of this fluid to Professor Bogert of Columbia University for analysis (Fig. 3).

An analogy between the dark bones of the hand and the dark test tubes can not fail to be noticed.

Granting the entire soundness of the physical facts of fluorescence as demonstrable by laboratory experiment, it is still important to know if the actual living tissue of a subject whose blood is impregnated with a fluorescent substance can exhibit fluorescence.

The following experiment demonstrates that such is the fact: Administering to the patient as above, twenty drops of a 1 to 30 aqueous solution of uranin, one hour later on, fold the lobe of the ear closely over an aluminum tube containing 20 milligrams of radium bromid of 1,000,000 radioactivity. If the experiment is done after remaining from fifteen to twenty minutes in the dark a faint glowing spot on the ear can be observed, not observable in a control experiment where uranin has not been employed. The same experiment may be made with the alæ nasi, and perhaps preferably on the thin fold of skin at the junction of the fingers with the palm.

RADIOACTIVE WATER AND FLUORESCENT LIQUIDS ADMINISTERED CONJOINTLY.

Doubt has been thrown on the possibility of radioactive fluids. There is no ground for this doubt. Such fluids promptly discharge an electroscope and retain this property for eight days if the fluid is kept in tightly corked receptacles. In a specimen furnished by me to Professor Pegram of the electrical department of Columbia University the radioactivity was at least one-half that of uranium oxid taken as a standard. If radioactive water is used to prepare fluorescent solutions, the fluorescence is highly augmented.

For this reason I administer to my patients under treatment by fluorescent fluids a tablespoonful of radioactive water morning and night.

It may be asked, but what effect has the radioactive water on the living being? Demonstrably, the water absorbs the emanations of radium and holds them for a considerable time, becoming now a secondary source of radiations similar to the original gamma rays. The charged water excites internal fluorescence.

CLINICAL EVIDENCE.

In a combined treatment, employing as I do the *x*-ray or radium, radioactive water and fluorescent fluids, which, where cure is affected, is the especial curative agency? I regard the fluorescent fluid as the basic agency and the radiations as excitants merely of the fluorescence. I regard it as essential, if one is to obtain the best results in the treatment of cancer, lupus, tuberculosis, Hodgkin's disease, eczema, psoriasis, etc., etc., to administer fluorescent remedies. Whether these fluids act as "sensitizers," whether they allow of the production of more oxygen by ionization as the *x*-ray and radium may act, thus augmenting the action of the latter at deeper situations, or whether the fluorescent light itself acts, as I believe, as does ordinary light and sunlight—these questions no one as yet can answer.

In support of the latter view, we may briefly summarize the action of light. Absorbed light in nature, while usually transformed into heat, may also, as has been said, be transformed into fluorescence and phosphorescence, may produce chemical effects as in photography, or in determining other chemical combinations, and may cause electric or mechanical phenomena.

Under the influence of light, plants absorb carbon and give out oxygen. They decompose the carbonic acid gas of the air by aid of chlorophyl.

Physiologically, light acts on the protoplasm and thus modifies vital processes. Its effect is both stimulating and irritating or destructive. According to Loeb,[18] "light is not only an irritant in a physiologic sense, but it actually infuses the organism with energy which is transmitted into other forms, for the most part of a chemical nature."

That light kills some bacteria is now established beyond dispute by the experiments of a host of observers.

The effect of light on animal organisms, including man, forms a most interesting chapter by itself. Light acts as a stimulus to the animal functions. Frog spawn in an opaque glass die, in transparent glass they develop normally. Darkness hinders and prevents the growth of many of the lower forms of animal life. Young mammalian animals, including children, develop more perfectly in light. Ciliary movements of epithelium in grown animals are modified by light. Light stimulates the action of unstriped muscular fiber and it stimulates pigment cells; it modifies the quality of the skin, reducing protoplasm to keratin; it produces intense inflammation of the skin. "The hemoglobin gives off its oxygen more quickly in the light than in the dark, hence light increases the oxidizing power of the blood, and correspondingly the process of oxidation in the human body." (Freund.) Some observers claim that light modifies the oxidation of the tissues. Many experiments tend to show that light also modifies metabolism by direct action on cells; others, however, deny this. Experiments also show that light modifies the temperature, respiration and the pulse.

APPLICATIONS IN DISEASE.

I employ quinin bisulphate in doses of from five to fifteen grains daily, according to the natural physiologic tolerance of the patient—fluorescin, a 1 to 30 aqueous solution, from six to twenty drops, three times daily, one hour after meals—esculin, from five to fifteen grains daily.

One patient has now taken, in treatment of an extremely obstinate case of lupus, ten drops of the fluorescin solution three times daily during the last three months and, employing the *x*-ray, not only has his lupus healed over large areas, but also he has gained thirty pounds in weight in the three months. Both in hospital and in private practice my cases of lupus heal more rapidly and get permanently cured by this method and in less time than by any other method I have used.

I have ready to report six patients with tuberculous glands of the neck, two already subjected unavailingly to numerous surgical operations for removal who are now perfectly well. One case of tuberculosis of the hip joint is making excellent improvement.

In tuberculosis of the lungs the method is giving good results, not yet ready to be reported on *in extenso*.

18. Quoted from Freund.

In from one to three days after beginning treatment a reaction occurs. The afternoon temperature in a recent case rose from normal to 103 F. The cough, night sweats and lassitude increased. Examination of the sputum at this time revealed an enormous increase of the number of tubercle bacilli. This reaction lasted about a week and then the temperature gradually fell to normal, with corresponding improvement in the other symptoms. The patient then entered on a stage of steady gain in weight and comfort and personal appearance. The case is under most rigid observation by skilled consultants and will be reported on later.

It is interesting to observe that the course of events in this and other cases follows accurately that described by Dr. Chisholm Williams[19] of London, England, in his forty-three published cases, treated by him by high-frequency currents, and with such brilliant results. Of his original forty-three cases, he writes: "Three have died; the rest, thirty-two, have had no treatment of any kind whatever for over eighteen months. Eight cases had, on an average, two months' treatment each since that time. This year none of them has needed treatment. The majority, who are workers, are performing their usual duties. The three deaths were due to pneumonia, tuberculous kidney, and lardaceous disease."

Dr. Williams remarks further, "There is reason to believe that currents act in these cases in the following manner: First, on the tubercle bacilli themselves by making them pursue the same course as if they were under the *x*-rays." According to the experiments of Dr. Forbes Ross and Norris Wolfenden,[20] in their paper, "Effects Produced in Culture of Tubercle Bacilli by Exposure to the Influence of an X-ray Tube," they observe that the bacilli rapidly increase in numbers and have a tendency to form clumps, then get small in numbers and shape, and take the microscopic stains very readily, but are pale in color. They say, in conclusion: "There is not the smallest doubt that *x*-rays stimulate them to excessive overgrowth, and only affect them adversely by attenuation from overgrowth."

Dr. Williams continues: "In my experience, much the same process goes on under the high-frequency treatment. The tubercle bacilli, which are usually present in fair numbers, quickly begin to increase and, after a few applications, are greatly increased; they soon, however, form clumps and get misshapen, short and stumpy, and generally curved, and take the stain more readily than before. After a time they begin to decrease in numbers and later, when the patient is obviously getting better in every respect, they may cease entirely, and may appear in the sputum after weeks of absence."

It should also be mentioned here that not only does the fluorescent method exert a direct remedial and curative action in phthisis, but it also has afforded me, and others to whom I have demonstrated it, a more accurate means of physical diagnosis as to the location and size and extent of pulmonary lesions. When one examines the thorax by the *x*-ray and the fluoroscope,

Fig. 1.—Normal skiagraph.

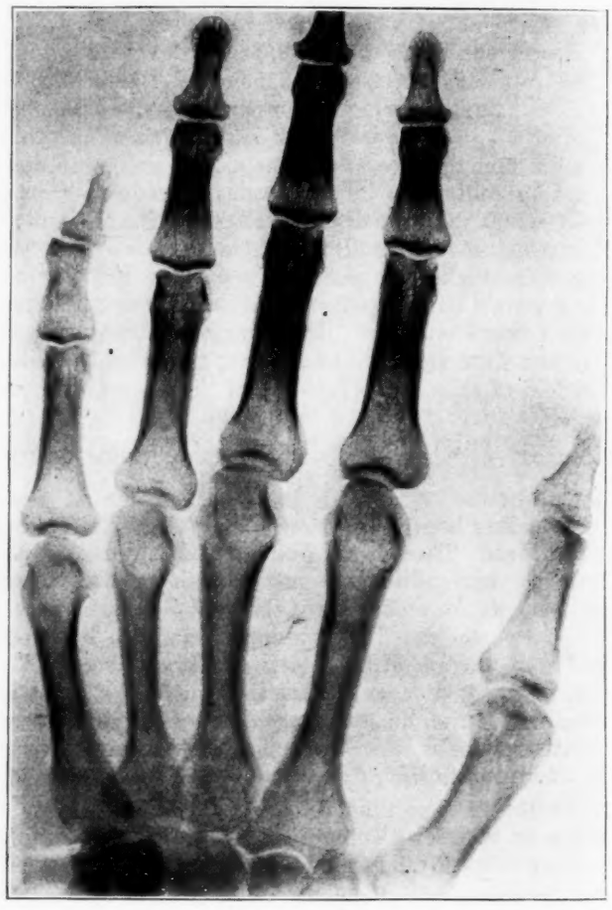

Fig. 2.—Skiagraph of same hand, under same conditions, after administration of fluorescin.

19. High Frequency Currents in the Treatment of Some Diseases, London, Rebman, Ltd., 1903, pp. 166-173.

20. Archives of Roentgen Ray, August, 1900.

first without the administration of fluorescin (or other fluorescible solution), and second, after it has been administered, one is struck by the great difference. With fluorescin, the lesions are more easily distinguishable, they cast a darker and clearer shadow on the fluoroscope, which in its lighter portions is at the same time more brilliantly illuminated. In a word, contrasts are greater and definition clearer. A skiagraph shows the same relative improvement in definition, as already pointed out in the illustration of the hand (Figs. 1 and 2).

In cancer I summarize only two cases briefly from my notebook. They are typical of many others illustrating the superior efficacy of the fluorescent method over *x*-ray treatment alone.

CASE 1.—Mrs. E. E. A., Jan. 28, 1904.

History.—Six years ago a tumor in the right breast and a gland in the axilla appeared. The entire breast was removed by Dr. W. E. Brown and pronounced carcinomatous. Cancer returned and extensive surgical removal was resorted to. Cancer again recurred and patient resorted to the use of the

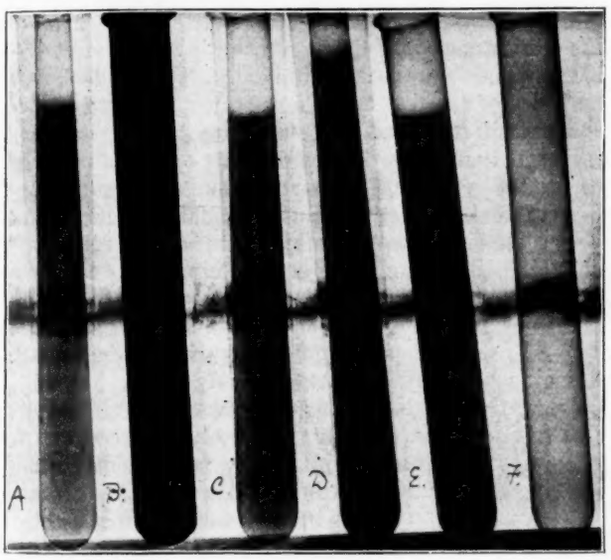

Fig. 3.—Absorption of Roentgen radiation by fluorescent fluids. Tube A. Sol. benzoate of sodium. Tube B. Empty test tube which had held a solution of esculin; it obstructs the *x*-ray as absolutely as would a thick sheet of lead. Tube C. Fluorescin in distilled water. Tube D. Distilled water. Tube E. Sol. esculin in distilled water. Tube F. Ordinary empty test tube.

x-ray, but to no avail. Four months ago the right arm began to increase in size and grew quite large. She then came to me.

Examination.—Brawny edema of right arm; a lump nearly an inch in diameter of stony hardness within the axilla; induration in the scar tissue; extensive induration at the pectoral fold; infection of the skin lymphatics and a few skin nodules; enlarged glands above the clavicle and the personal appearance of carcinosis. She had lost flesh and was sallow, pale and anemic.

Treatment.—The patient was put on quinin and *x*-ray combined. By March 1 the swelling of the arm subsided. Owing to the difficulty of getting the *x*-ray into the axilla, radium bromid, 20 milligrams of 1,000,000 radioactivity in two aluminum tubes, was employed, placed directly on the hard axillary tumor, one hour daily, for a month. A radium "tan" was established and the skin peeled off several times.

Result.—May 26: No sign of disease remains. The cachexia has disappeared. Patient has regained her normal weight and is discharged to await events.

This is the first case in which the cervical glands were involved in which I have seen recovery.

CASE 2.—Mrs. L. E. W., July 12, 1904.

History.—About five years ago the right breast was removed by the "plaster" process, on account of a tumor about the size of an orange. Five recurrences have ensued, each one in turn treated by the same method.

Examination.—An open ulcer about three inches long and three-quarters of an inch wide is situated in the center of extensive and widely infiltrated edges of surrounding tissue. A small, hard tumor was found in the axilla; also enlarged glands.

Treatment.—Fluorescin and *x*-ray combined; usual technic and radium, high intensity as in Case 1.

July 27: Ulcer already almost healed.

September 8: The indurations surrounding the cicatricial tissue, the enlarged glands, and the small, hard tumor in the axilla are fast disappearing. The ulcer is long since completely healed.

Result.—October 15: Patient returns home to-day. Careful examination reveals no infiltration and absolutely no sign of her former disease can be found.

Dr. A. Beclere[21] of Paris reports a case of cure of osteosarcoma of the superior maxilla, recurrent after having been twice removed surgically during a period of three years. "Synchronously with the *x*-ray treatments, and half an hour before their application, were administered 50 cgm. of the bichlorhydrate of quinin, as recommended by Dr. Morton of New York." Beclere considers that the details of this case may fairly be considered as indicating that the quinin, through its property of fluorescing when subjected to the influence of the *x*-ray, may have been a factor in producing the cure, but is not ready to commit himself positively on this point without having observed more cases. The reviewer continues: "The case is certainly very important, as the cure of a malignant process involving bony tissue by radiotherapy alone is at present almost, if not quite, an unparalleled event."

I am glad also to note that Dr. R. C. Kemp of New York, following my suggestion of the use of fluorescent solutions in diagnosis and treatment, has demonstrated its value as a means of determining the position and size of the stomach.

Dr. Solomon Solis-Cohen of Philadelphia has brilliantly verified the value of the method, employing a special stomach lamp of his own construction. I have found that the illumination is increased by the use of radioactive water and also that no technic as to fluids and bicarbonate of soda is of special value. A simple solution of fluorescin in plain water (⅛ of a grain of fluorescin to a pint) is all-sufficient to produce a vivid illumination when the stomach lamp is introduced. Doubtless many other applications similar to transillumination of the stomach will follow the method of the internal use of fluorescing solutions I have outlined.

Among cases in which I have found the method useful are carcinoma and sarcoma, lupus, Hodgkin's disease, tuberculosis and phthisis, eczema, psoriasis, and also in many nervous affections and insanity.

SUMMARY AND CONCLUSION.

1. The excitation of fluorescence within tissue is a species of phototherapy and dependable on the same basis for curative effects. The term sensitization is not accurate, for it is not known what the term means. There is no proof that fluorescent substances make the cells or other micro-organisms vulnerable to the exciting radiation.

2. What the fluorescent light lacks in intensity is compensated for by propinquity to tissue.

21. La Radium, July, 1904, quoted from Arch. of Elect. and Rad., September, 1904, p. 355.

3. The methods of Tappeiner, 1900, followed by Dreyer, 1903, consists primarily of superficial applications, or of parenchymatous injections submitted to the action of sunlight or to the action of the electric arc light.

4. The method here outlined consists of a medicinal saturation of the entire blood system with a fluorescent solution and submission of parts or of the whole of the patient to the Roentgen and Becquerel radiations and to electric discharges.

5. The method naturally includes filling cavities with fluorescent solutions, as well as using these solutions medicinally.

6. This method is not of the same category as sensibilitization by Dreyer's method, for the process and the results are different.

7. The curative effects obtained by this method are probably due to the fluorescent light.

8. This method permits of an improvement in skiagraphic effects and of fluoroscopic examinations.

9. Following the suggestions of the use of fluorescent solutions in diagnosis and treatment, the method has proved of value in determining the position and size of the stomach and other cavities of the body.

10. The thoracic cavity presents on the fluoroscope a degree of illumination greater than that produced by the *x*-radiation alone.

11. The method is useful in tuberculosis of the lungs, and in other cases of tubercular deposit, as well as in cancer.

THE DIAGNOSIS AND TREATMENT OF PERFORATION IN TYPHOID FEVER.

WITH A REPORT OF 19 CASES, OF WHICH 16 WERE OPERATED ON, WITH FIVE RECOVERIES.*

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The diagnosis and treatment of acute appendicitis are now so clearly defined and so generally recognized that it hardly seems credible that about twenty-five years ago bitter controversies were being waged in New York City as to the propriety of the use of the aspirating needle in the diagnosis of this condition, and an occasional recovery after the opening of an appendicular abscess attracted great attention.

It was at about this time, in 1884, that Leyden first made the suggestion that perforation occurring during the course of typhoid fever should be treated surgically. Contrast the fact that thousands of cases of appendicitis are now successfully operated on annually and that a paltry 362 cases constitute the whole literature of surgically treated typhoid perforation! And this for a condition which, according to the well-known statistics of Taylor, costs from 20,000 to 25,000 lives yearly in the United States alone.

The surprise, which at first glance seems inevitable, yields on a more careful consideration of the situation. While there are many things in which the two conditions have a close resemblance, there are other important points of difference. The first is that the majority of practitioners see relatively few cases of typhoid fever, and the clinical picture is one which is, unfortunately, only well known in all its various forms to those who have had the opportunity of hospital practice. Appendicitis is a disease of every-day occurrence, and the practitioner whose field of work is even limited has a more or less extensive opportunity for knowing the disease. Then, too, appendicitis strikes in health or after a previous attack, and the differential diagnosis is between unassociated conditions. Perforation, on the other hand, occurs during the course of a disease, the progress of which presents an infinite number of variations, which irregularities may be due to a great variety of causes. The typhoid stupor is not conducive to affording much aid from the patient, and hence we must depend on the intelligent observation of nurses rather than on the subjective complaint of the patient; so that, while the diagnosis of perforation may in some cases be exceedingly easy, in other cases it may be very difficult, and in still others absolutely impossible.

Advances have been made, it is true; yet, when compared with what has been accomplished in appendicitis, much remains to be done to popularize the diagnostic features of perforation, in spite of the fact that not a few excellent papers have been published which present the clinical aspect of this condition in the clearest possible way and leave nothing to be desired. Yet, look at the majority of the text-books now in the hands of students and practitioners and judge whether anyone, from reading even the latest editions of some of them, could recognize the occurrence of perforation early enough to render surgical interference possible. This is all the more unpardonable, since this subject has been so actively and ably studied during the past few years. The lore which lies buried in society reports, hospital bulletins and medical journals is not the working stuff which reaches the general practitioner and guides him in the darkness and despair which envelope these gloomy hours.

This, then, is my excuse for presenting this topic at this meeting, and possibly a review of the recent experiences at Mt. Sinai Hospital may be of some value in showing some of the varied clinical aspects of perforation.

This series of 19 cases of perforation out of a total of 216 cases (8.8 per cent.) of typhoid fever occurring at one hospital may possibly now subserve a better purpose than a collection of cases in different parts of the country, observed by different men under different conditions. Indeed, there is no excuse for this since the statistical side has been so ably treated by Keen, the Johns Hopkins School, Hare, Hays, Elsberg, Harte and Ashhurst, and other writers.

I have restricted myself to the cases which have occurred during the past two years, since those before that time have not been reported in sufficient detail to make them of special value for this purpose.

I am indebted to my colleagues, Drs. Meyer, Rudisch, Berg, Davison and Koplik for their courtesy in allowing me to report the cases which occurred in their services.

It will at once strike you that this is a very large number of cases to report for so short a period. It must remain an open question whether there may not be some seasonable variations which are peculiar to typhoid fever—that is, whether the typhoid bacilli which are responsible for the present epidemic have more ulcerating qualities, if one may be allowed to use this expression; or whether the large number may not be due to peculiarities of treatment; or, again, whether the question may not be explained by the better training and constant watch for the possibility of the occurrence of perforation.

*Read in the Section on Practice of Medicine at the Fifty-fifth Annual Session of the American Medical Association, June, 1904.

As regards the first point, it has been frequently noted that there have been variations in the frequency of perforation. Curschman and Osler also refer to the great variations in the frequency of perforation in different epidemics, both from the clinical and from the autopsy records, the variations being from 4 per cent. to 33 per cent. There is also a difference in the statistics as to mortality from perforation, the German being much lower, Curschman giving 9 per cent. to 10 per cent. as the average mortality rate, while Osler's figures give 30 per cent. of all deaths as being due to perforation.

As regards the influence of treatment in this series, this can be dismissed in the present instance, since the cases occurred in various services and were not subject to any particular plan of treatment.

The third point probably affords the correct solution, namely, our better training and the ability to correctly interpret symptoms which formerly would have escaped notice. I have gone over many hospital reports and series of cases which have been published, and without exception I have noted that, whereas the first few cases occurred scattered at long intervals, the latter part of the series consisted of cases which occurred within a comparatively short time, thus showing that, as each observer's knowledge of the symptoms had improved, so had his diagnostic skill.

That a diagnosis is possible in the majority of cases is shown by the fact that of the 16 cases of this series which were operated on, the diagnosis was verified at the time of operation, and the 3 cases which were not operated on leave no room for doubt, either in the case which recovered or in the two which died.

To attempt any classification of these cases from a diagnostic standpoint is at present both impossible and futile. Thus, it is idle to divide them into the appendicular, the intestinal, and so forth, and it is useless to conjecture what pathologic changes might be present, since there is, unfortunately, no relation between the latter and the patient's symptoms. It is this lack of relation which often makes the diagnostic problem so difficult, and the confusion which has resulted from confounding perforation with a resulting peritonitis must be cleared up if early diagnoses are to be made. No more striking proof of the great extent to which this confusion still prevails can be offered than that which is afforded by the most recent and certainly the most elaborate and best work on typhoid fever in the German and English languages, i. e., Curschman's treatise and its American edition by Osler. In neither is there any index reference for perforation, and it is only referred to under perforative peritonitis.

A much more practical classification is that which is based on the mode of onset, whether abrupt or gradual. This is a useful grouping; it aids greatly in making a prognosis as well as a diagnosis, since a careful examination which I have made of a large number of published cases has demonstrated the fact that cases with an abrupt onset are much more favorable than the other group, because not only is early operative interference possible, but also, as a rule, the general course is more favorable.

In the present series the onset was gradual in 4, all of whom died, 2 having been operated on. In the other 15 cases the onset was abrupt, with 6 recoveries, 5 of which were operative cases. The mortality in the cases of gradual onset was 100 per cent., while in those of abrupt onset it was but 60 per cent.

It is not my purpose to bore you with a wearisome recital of the details of the 19 cases of perforation, since those who are interested will find these data appended in the chart and the report of the cases. Instead, I will try to give, as briefly as possible, the important features which may be serviceable from a diagnostic standpoint.

As usual, males predominated, there being 15 males to 4 females. The ages ranged between 6½ years and 42; 3 were under 10 years, 5 between 10 and 20, 6 between 20 and 30, 3 between 30 and 40, and 2 were 42 years old.

Plunges were used in 5 cases; not used in 14.

Bowels were constipated in 7; diarrhea in 4; variable in 8.

The day of perforation varied from the ninth to the fifty-eighth day of the disease.

	Cases.		Cases.
First week	0	Sixth week	1
Second week	5	Seventh week	1
Third week	5	Eighth week	0
Fourth week	3	Ninth week	1
Fifth week	3		

The onset was gradual in 4, and sudden in 15 cases.

FIRST SYMPTOM:

	Cases.
Abdominal pain	10
Pain and chill	2
Pain and vomiting	2
Vomiting	1
Chill	2
Changes in condition and rise in pulse and respiration	1
Changes in condition and abdominal tenderness	1

Of all the symptoms, pain will always remain the most important. It was present in 17 of the 19 cases of the series, being absent only in the 2 delirious and comatose cases, and in 14 it was the first symptom or onset. As this symptom deserves special attention it will be considered in detail later on.

Of the conditions of the abdomen, tenderness is a very varying symptom as regards extent, locality and severity. A far better guide is abdominal rigidity, which was present in 16 cases, was variable in 2 and absent in 1.

Distension is also an uncertain guide, as it was marked in only 6, was slight in 8 and absent in 3; in some of the latter the abdomen was even retracted.

Movable dullness in the flanks forms quite an important symptom, and was present in 8 cases, absent in 8, and not stated in 3.

As to the obliteration of liver dullness, much more would be gained from this symptom if physicians would make it a rule to note the variations in the size of the liver dullness throughout the disease. The time which is now wasted in examining the spleen during the course of the disease would be far better spent if devoted to the percussion of the liver and abdomen. The obliteration of the liver dullness is best noted in the axillary line, since this area is less subject to disturbing factors from undue distension of the colon and small intestine. The time of the occurrence of the obliteration of liver dullness is variable, and may even be absent in cases of perforation where free gas is localized in the peritoneal cavity by pre-formed adhesions. It was present in 11 cases, and was either absent or of doubtful value in 8 cases.

Posture: All children had flexed thighs.

Temperature: Fell, 3; rose, 9; unchanged, 4; could not be ascertained, 3.

Pulse: Fell, 0; rose, 12; unchanged, 4; could not be ascertained, 3.

Respirations: Fell, 0; rose, 10; unchanged, 6; could not be ascertained, 3.

Number of leucocytes: Rose, 7; fell, 3; no marked change, 6; could not be learned, 3.

Collapse was present only once; sweating, twice.

No observations on changes in blood pressure, to which some observers (Elsner and Crile[1]) have called attention, were made. For obvious reasons this will never be an important guiding symptom in this condition.

Results: Died, 13 (68.4 per cent.); recovered, 6 (31.6 per cent.).

Operated on, 16; died, 11 (68.75 per cent.); recovered, 5 (31.25 per cent.).

Not operated on, 3; died, 2 (66 per cent.); recovered, 1 (33+ per cent.).

In 1902, out of 107 cases of typhoid fever treated at the hospital, there were 9 cases of perforation, with 1

	Cases.		Cases.
5 hours	1	21 hours	1
6 hours	3	43 hours	1
8 hours	1	48 hours	1
11 hours	2	72 hours	1
12 hours	2	Unknown	6

I wish to draw especial attention to the diagnostic significance of pain. As already stated, it occurred in 17 of the cases of this series, and in 14 was the very first symptom of onset. It varies in degree and in location. It also varies in its character, but is usually more or less paroxysmal. Its severity may be so marked that the more or less comatose patient may cry out with pain; on the other hand, it may be very mild, indeed. It may

Case No.	Sex and Age.	Bowels.	Day.	Onset.	First Symptoms.	Abdominal Pain.	Chill.	Vomiting.	Collapse.	Sweating.
1	M. 18.	Constipation and diarrhea.	16	Sudden	Vomiting.	Yes	No.	Yes.	No.	No.
2	F. 6½	Constipation.	32	Sudden	Chill	Yes	Yes.	Late.	Gen. condition bad.	No.
3	M. 23.	Constipation.	13	Sudden	Chill	Yes	Yes.	No.	No.	No.
4	M. 35.	Diarrhea.	9	Sudden	Severe pains in right iliac fossa and cramps.	Very severe; at first in right iliac fossa, then general and both steady and paroxysmal.	None	Late.	No.	Yes.
5	F. 42.	Constipation.	14	Sudden	Severe pain in abdomen and chilly; also tenderness in vagina.	Severe; at first severe pain in abdomen; later low down in right iliac fossa. Also considerable tenderness in right vaginal fornix.	Yes.	Late.	No.	No.
6	F. 42.	Constipation and diarrhea.	58	Gradual; concealed symptoms.	General abdominal pain.	Yes; tenderness in right iliac fossa; moderate abdominal pain.	No.	No.	No.	No.
7	M. 22.	Constipation and diarrhea.	18	Sudden	Abdominal pain	Tenderness in right iliac fossa; cramps.	Yes.	Late.	No.	No.
8	M. 12.	Constipation and diarrhea.	43	Sudden	Severe pain in umbilicus.	Severe; in umbilicus	No.	Yes.	No.	No.
9	M. 22.	Constipation.	15	Sudden	Severe abdominal pain.	Yes; cramplike	Yes.	No.	No.	No.
10	M. 38.	Constipation.	18	Sudden	Severe pain in abdomen.	General.	No.	No.	No.	No.
11	M. 13.	Constipation and diarrhea.	10	Gradual	Pulse and respiration rose	Yes; caused by flexion of thigh.	No.	Only late.	No.	No.
12	M. 7.	Constipation and diarrhea.	14	Sudden	Sudden crampy pain in abdomen and chill.	Yes; cramps	1 at onset; 1 14 hrs. later.	No.	Yes.	No.
13	F. 9.	Constipation.	27	Sudden	Sudden pain and vomiting.	Yes; especially on change of posture, lies with thighs flexed.	No.	Yes.	Yes.	No.
14	M. 19.	Diarrhea.	31	Sudden	Sudden sharp pain and chilly.	Sharp cramps; cries out with pain.	Slight	No.	No.	No.
15	M. 30.	Diarrhea.	25	Gradual; hemorrhage preceding day. Onset marked by abdomen becoming somewhat distended: lessening of liver dullness then loss of pint of blood.	Abdomen became distended. Hemorrhage.	No (comatose)	No.	No.	No.	Late
16	M. 16.	Diarrhea.	23	Gradual change in patient; slight abdominal distension. Tenderness in right iliac fossa. No pain.	Tenderness in right iliac fossa.	No (delirious)	No.	No.	No.	No.
17	M. 21.	Variable	36	Sudden	General abdominal pain and cramps.	Yes	No.	No.	No.	No.
18	M. 24.	Constipation	35	Sudden	Severe abdominal pain.	Yes	No.	No.	No.	No.
19	M. 25.	Variable	15	Sudden	Stabbing abdominal pains both sides.	Yes	Yes.	Yes.	No.	No.

operative recovery and 1 non-operative recovery, giving an operative recovery of 11+ per cent. In 1903, out of 109 cases of typhoid fever, there were 10 cases of perforation, 8 of which were operated on and 2 were not operated on; both of the latter died Of the 8 operated on, there were 4 recoveries (50 per cent.) If objection be made to including the 2 cases of recovery where fecal abscesses were opened, there would still remain 2 operative recoveries out of 6 cases of perforation operated on, namely, 33+ per cent. of recoveries.

Time of operation (reservation being always made as regards the exactness of such estimation):

1. THE JOURNAL A. M. A., 1903, vol. xl, p. 1292.

remain more or less constant or it may gradually disappear; it may even be concealed, as occured in Case No. 6, to avoid operation. It may be referred to any part of the abdomen, and even to other parts, like the penis, the umbilicus, or to the left iliac fossa. In the latter, which occurred in Case No. 6, an omental abscess was found near the tender area.

It is the constancy of the early occurrence of pain in cases of perforation which renders the proper interpretation a matter of very great importance. The correct appreciation of the exact significance of attacks of

2. Further details will be found in the chart of the symptoms of the cases.

pain during the course of typhoid fever is by no means an easy task, and we are greatly indebted to McCrae[3] for his instructive analysis of the relation of pain in 500 cases of typhoid fever. Of this series the most important were the 161 cases (32 per cent.) in which there was more or less marked pain during the course of the disease. In these 161 cases of pain the pain was referred to perforation in 13 cases, to hemorrhage in 13, to some known cause in 65, but in 70 cases no explanation could be found.

This subject is so important that I may be pardoned if I name the various conditions to which the pain was referred in the 65 cases where the cause was discoverable were included several cases in which the pain was very severe and accompanied by rigidity, tenderness, leucocytosis and diminished liver dullness. Two of these cases were operated on; in one only the angry bases of inflamed Peyer's patches could be found; in the other nothing was discoverable. In others of these cases it was surmised that enlarged mesenteric glands might have caused the pain.

McCrae states that of the various conditions in which pain occurred, the association of perforation and hemorrhage was most puzzling. The two cases in my series corroborates this statement. The possibility of the two conditions occurring together should always be borne in

Temperature.	Pulse.	Respiration.	Abdomen.	Flank Dullness.	Obliterated Liver Dullness.	Leucocytes.	Operation.	No. of Hours.	Result.
No marked change....	No marked change.	Rose.....	Rigid; slightly distended.	Yes.....	Yes.....	No great change; 3,500-5,000.	Yes	12	Death.
No marked change....	Rose.....	Rose.....	Rigid; slightly distended.	No.....	Yes.....	Rose 7,400-18,000...	Yes	8	Recovery.
Rose 101-103 and then fell.	Rose.....	No change first day; then rose.	Rigid; much distended.	No.....	Yes (movable)....	Rose 5,600-14,000...	Yes	43	Death.
No change	Rose.....	Rose.....	Rigid; much distended.	Yes.....	Yes.....	Rose 8,600-13,400...	Yes	11	Death.
Rose..	Rose.....	Rose and fell.....	Lax but tender: not distended.	No.....	Not till late.....	No great change; 3,200-4,800.	Yes	21	Death.
99.8-102: rose.....	100-122; rose...	No change.....	Rigid, especially in left iliac fossa; not distended.	No.....	Not till late.....	Fell 12,000; 5,700-11,000.	Yes	12	Death.
103-106; rose.....	96-136; rose....	No change.....	Rigid; later relaxed; distended.	No.....	General tympany. Later changeable.	8,000-7,000; 7,500...	Yes	9	Death.
Rose 100.2 to 102.2; then fell to 98.6; rose to 104.	100-128; rose...	24-32; rose.....	Rigid; distended...	Slight.....	Yes.....	Rose 9,000 to 14,000. Three days later fell to 5,000.	No	.....	Recovery.
Fell 102.8-101.8; then rose to 104.2.	96-138; rose....	24-28; rose.....	Rigid; distended...	No.....	Yes, and changeable.	Fell 8,500 to 4,500..	Yes	11	Death.
No change.....	No change....	Rose.....	Great rigidity; distended.	No.....	Yes, and changeable.	Fell 8,500 to 5,300..	Yes	.....	Death.
Fell 103-101.6 and oscillated.	116-140; rose...	30-52; rose.....	Rigid; slightly distended.	Left flank dull and tender.	Yes.....	Rose 5,200 to 11,200	No	.....	Death.
Admitted with perforation.	Admitted with perforation.	Admitted with perforation.	Rigid; distended...	Movable.....	Yes.....	10,400.....	Yes	30	Recovery.
102-105: rose.....	108-174; rose...	Stationary at 34...	Very rigid; slightly distended.	Yes; right iliac fossa not movable.	No.....	Rose 6,000 to 10,600.	Yes	5	Death.
102.4-105; rose.....	90-120; rose....	Abdominal; stationary at 32.	Rigid; slightly distended.	No.....	Yes (3 hours).....	Rose 8,200 to 10,800.	Yes	6	Recovery.
Severe septic type with upward tendency.	Severe septic type with upward tendency.	Upward tendency (thoracic).	Variable rigidity; slightly distended at first; later marked.	No.....	Yes.....	Stationary; 4,900 to 5,800.	No	.....	Death.
No change	100-170; rose...	Irregular; rises and falls 30-45.	Rigid; late distention.	Yes.....	No.....	Rises and falls 11,600-9,800; 11,700	Yes	.....	Death.
Admitted with perforation.	Admitted with perforation.	Admitted with perforation.	Moderate rigidity; no distention.	Yes.....	Yes.....	9,000.....	Yes	72	Recovery.
Fell 102.2-101.6.....	No change....	Thoracic.....	Slight rigidity, but soft; at first concave.	No.....	Slight.....	6,000-6,600.....	Yes	6	Death.
(In hospital). Fell from 105.2 to 101.8.	Admitted with perforation.	26.....	Rigid; retracted, but became more distended.	Yes, but not movable.	Yes, mammillary, not axillary.	14,200.....	Yes	48	Recovery.

ble. They were, first, hysteria, pleurisy, pneumonia, distended bladder, abortion, labor and menstruation; second, gastrointestinal conditions apart from complications, i. e., taking solid food, vomiting, constipation, fecal impaction and diarrhea; third, various abdominal conditions, i. e., appendicitis, peritonitis, cholecystitis, rupture of the gall bladder, liver abscess, painful spleen (rupture or infarction), phlebitis and thrombosis of iliac vessels.

Among the 70 cases in which no cause was discovera-

mind, and McCrae very properly warns against the danger of opium in such cases, since the symptoms may be masked by it. Every case of hemorrhage with marked symptoms should be regarded as being possibly associated with perforation.

It is unfortunate that the time at my disposal does not permit a more careful discussion of these two conditions, for the further consideration of which and the other associated conditions I would refer to the paper above cited and also to a most careful analysis by McCrae and Mitchell on the "Surgical Features of Typhoid Fever."[4]

3. New York Med. Jour., May 4, 1901; see also Martin, de la Douleur Abdominale dans la Fievre Typhoide, These de Paris, 1901, which corroborates McCrae's statements.

4. Johns Hopkins Hospital Reports, vol. x.

The solution of some of these problems of the real significance of pain will be found when we know more about the exact relation of non-perforative peritonitis in typhoid fever. A recent paper by Yates[5] contains a very full bibliography and presents a number of most instructive facts as to its varied relations. Non-perforative peritonitis is one-third as frequent as perforation, since it was found present in 73 out of 4,300 cases (1.7 per cent.) collected by Horton Smith and Hoelscher and Liebermeister.

The symptoms of peritonitis as given by Yates are exactly those of perforative peritonitis, and in the 20 cases which he has collected were so regarded, as will be detailed later on in the discussion of the treatment.

These cases of localized peritonitis without perforation, like the case of Murphy,[6] the 5 cases of Gairdner,[7] the 2 of Shattuck, Warren and Cobb,[8] and others, may be cited as showing how exceedingly important it is to always bear in mind the relation of non-perforative peritonitis in the differential diagnosis of pain.

In drawing practical conclusions from this analysis of the varied clinical features of perforation as it occurred in this series, it will at once be seen that there is no one symptom or group of symptoms which is pathognomonic. Its recognition demands intelligent watchfulness and judgment on the part of the physician, and especially the nurses.

Osler's[9] schema for the observation of symptoms in suspected perforation is a useful guide which should be both studied and used by the physician, and especially for the instruction of nurses.

To my mind the first important fact to note is that there is a more or less marked change in the condition of the patient; associated with this, there is usually some form of abdominal pain which is very variable. The condition of the abdomen as regards tenderness, rigidity, distension, respiratory excursions and the liver dullness which have been routinely observed, now afford valuable aid. Movable dullness in the flanks gives distinct evidence of peritoneal exudate. In the meantime the anxious facies and sweating are significant guides. Changes in the rate and character of the pulse mean much more than do changes in the temperature and respiration. The leucocyte count is of so little value that the general practitioner may very well disregard it in private work Probably more will be gained from a simple hemoglobin test to exclude a concealed or misleading hemorrhage.

Finally, it is the combination of the symptoms, their progressive character and development which must enable one to make a presumptive diagnosis.[10] It is far safer to assume that the symptoms point to the occurrence of perforation and to prepare for possibilities and rapid action than to take the opposite standpoint and wait for the fully developed symptoms of peritonitis.

If these facts be borne in mind it becomes much easier to understand the statements made by all writers that the marked symptoms are not those of perforation, but of the complicating peritonitis. It also becomes easy of comprehension that most physicians expect too many and too pronounced symptoms for an early diagnosis of perforation, for the appearance of which they often sacrifice the golden time for successful operative interference, since the fact is so often overlooked and so seldom understood that the perforation itself causes little shock and may even afford temporary relief.

It is absurd to state definitely in many cases that the perforation occurred at this or that time, and that the operation was performed a certain number of hours after perforation. Such estimates are only approximate and are liable to great errors. We are really only entitled to say that the operation was performed at such an interval after the occurrence of certain symptoms. However, as no other guides are given, this is often the best that can be done, and in what follows I would have such statements as to the time of operation so understood.

The reason for this statement is that the occurrence of acute symptoms does not necessarily mean that this coincides with the time of perforation. Anyone who has seen a number of cases of perforation must have been struck by the difficulty of estimating the exact time of the occurrence of the accident. Corroboration of this will be found in the statement made by Shattuck, Warren and Cobb, that early warning pains, earlier by a definite number of hours than the severe symptoms, occurred in 14 out of the 21 cases of perforation reported by them.

Before considering the question of treatment, a few words may be said as to the possibility of the spontaneous cure of perforation. Most authorities deny this positively. The views of Fitz[11] and Curschman and Osler[12] leave little room for doubt as to the certainty of their convictions. The cases in which spontaneous cures have occurred are supposed to have been either appendicular perforations in the course of typhoid, or cases of peritonitis which have simulated perforation My own belief, from what I have seen, is that spontaneous cure is possible and probably occurs more often than we think, if the perforation is a small one and is immediately shut off by adhesions or omentum. I may refer to Case No. 8 as one of spontaneous cure, and to Case No. 18, in which a small perforation was found at the autopsy well sealed by adhesion of omentum.

Cases have been reported by Bucquoy, Trousseau, Cruveilhier, Reunert, Bühl, Widal, Dieulafoy, Chantemesse and Remlinger[13] in which recovery has been due to protective adhesions, fibrinous deposits and by the agglutination of intestines, omentum or mesentery. Furthermore, Haegle-Pasavant, Villemin and Walther have reported recoveries with intestinal fistulæ. The cases of Bucquoy and Widal are especially interesting, since the patients having died from other conditions, the evidences of the healed perforations and adhesions were found at autopsy.

Granting the possibility of spontaneous cure, the best results ever claimed for nature's method have been 5 per cent., and even the recoveries with fecal abscesses can hardly be called ideal recoveries. Contrast this with the latest statistics published by Hare and Ashhurst of 362 cases which they collected from the literature, with a recovery of 26 per cent. Granting that these statistics represent in the main successful cases and may not include many unreported unsuccessful cases, yet the contrast is sufficiently striking as to leave no doubt as to the best plan for treatment.

5. American Medicine, May 2, 1903.
6. Keen: Surgical Complications and Sequels of Typhoid Fever, Philadelphia, 1898, p. 238.
7. Glasgow Medical Journal, vol. xlvi, p. 114.
8. Boston Med. and Surg. Jour., June 28, 1900.
9. Philadelphia Medical Journal, Jan. 19, 1901.
10. See also McCrae and Mitchell's summing up of the various symptoms on pp. 410-411, Amer. Med., Sept. 13, 1902.
11. Trans. of the Assn. of Amer. Physicians, vol. vi, 1891, p. 207.
12. Typhoid and Typhus Fever, Nothnagel's Encyclopedia, American translation, p. 233.
13. Bull. de la Soc. Imp. de Constantinople, Seance du 15 Mars, 1901.

This consists in making as early a diagnosis as possible, and this, or a strongly probable diagnosis having been made, an immediate operation is indicated.

It is a matter of great regret that in private practice the patients are under a great disadvantage in regard to what constitutes an early operation, for reasons which are obvious, unless the possibility of surgical complications receive that prompt consideration and action which is afforded to patients in the hospital. No time should be lost by the attending physician in making suitable preparations for the surgeon while he is stimulating the patient and awaiting the final decision as to the course of action. No harm will be done by making needless preparations; much will be gained by making timely preparation for prompt action.

The only exception to the rule of early operation is that moribund patients should not be operated on.

In making the prognosis it must not be forgotten that the patient must still run the gauntlet of the balance of his attack of typhoid fever, in passing through which, however, he will have been made none the worse by the operation. This also holds for those cases in which no perforation has been found, unless, of course, the underlying condition which produced the misleading symptoms should cause a fatal issue. The wonderful endurance and resistance of typhoid patients enable us to hold out a much more hopeful prognosis than would be deemed advisable under other conditions. The operation in skillful hands, with local or general anesthesia, is infinitely less dangerous than the possibilities of the complications of the disease. Furthermore, I have observed that in some of the patients who have survived the operation for perforation, the balance of the disease seems to have been cut short by the operation. McCrae and Mitchell have also observed this. Lenander, quoted by Cushing,[14] discourages delay, and even goes so far as to regard the narcosis and operation as a means for combating the shock due to perforation.[15]

The cases in which a perforation has not been found are often by no means needless interferences, since an impending perforation may be prevented or undue distension may be relieved by low ileostomy, as done by Cushing and Esher. Furthermore, Yates' statistics show that of 20 cases of peritonitis in typhoid fever which he collected, 11 were operated on with 4 recoveries; 9 were not operated on, and all died. Of the 11 cases operated on, one was a case which was operated on for appendicitis, but proved to be a walking case of typhoid fever with peritonitis. All of the others were cases of typhoid fever which were operated on for supposed perforation, but in which only peritonitis was found. Finally, Cushing has reported a case which was under his care in 1889, and was operated on for symptoms of supposed perforation. No intestinal lesion was found except a chronic adherent appendicitis. The removal of the appendix under cocain anesthesia gave immediate relief from the abdominal symptoms, and the patient recovered from his typhoid fever.

If, however, an early diagnosis has not been made, the indications for immediate operation are not so clear and the cases must be individualized as to the advantage of waiting or of operating, since Nature does cure some of these cases. But who can surely pick them out and what means have we at our disposal to know whether the opening has been closed by the adhesion of omentum or by a thick layer of fibrin?

Cases 17 and 19, in which successful operations were performed many hours after perforation, enormous fecal abscesses being found notwithstanding the fact that the patient's general condition was good, show that even a late operation has its indications.

These 2 cases (17 and 19) deserve a few words. No one looking at Case 17 would have suspected that he had nearly two quarts of fecal fluid in his peritoneal cavity—nothing in his condition on his admission to the hospital, even after his transportation, would have warranted this assumption, except a careful consideration of the history and the proper interpretation of the physical signs. To have relied on the clinical text-book description would have been absolutely misleading.

Even more striking is the last case (No. 19). This was a walking case where perforation occurred on the fifteenth day. He was admitted to the hospital twenty-four hours later. A leucocytosis of 14,000 was found; the local rigidity and tenderness in the abdomen lessened; his temperature dropped from 105.2 F. to 101.8 F.; pulse and respiration improved decidedly, and his whole appearance was better. On the following day the only disturbing features were that there was a little more distension, the liver dullness had decreased, and he had vomited twice during the night. The operation was then performed, and an enormous fecal abscess was found. The patient has recovered in spite of a complicating pneumonia. An additional feature of interest is the fact that the Widal reaction was repeatedly negative till the forty-second day; the positive diagnosis of typhoid fever had, however, been made on the twenty-sixth day by the finding of typhoid bacilli in the blood culture.

Wilson of Philadelphia, the earliest advocate of operative interference in this country, wrote as follows in 1886:[16]

> Granted that the chance of a successful issue is heavily against you; that the patient is in the midst, or at the end, of a long sickness; that the tissues are in the worst state to stand the injuries of the surgeon's knife; that the lesions of the gut may be very extensive; that the vital forces are at the lowest ebb; no one has yet for these reasons refused to perform tracheotomy in the laryngeal complications of typhoid fever, which requires it to save life. The operative treatment of purulent peritonitis has been performed successfully many times by gynecologists in conditions scarcely less promising. In point of fact, the objections which may be urged against laparotomy in intestinal perforation in enteric fever are no more forcible than those which would have been made use of at first against the same operation in gunshot wounds of the abdomen. . . . The courage to perform it will come of the knowledge that the only alternative is the patient's death.

Mikulicz[17] stated in 1884:

> If suspicious of a perforation, one should not wait for an exact diagnosis and for peritonitis to reach a pronounced degree; but, on the contrary, one should immediately proceed to an exploratory operation which in many cases is free from danger.

It is hard to believe that these views were written in 1886 and 1884, respectively; it is still more difficult to modify or change in any respect these terse and telling sentences which so truthfully represent the experience and opinions of all physicians who have had practical experience with this most trying complication of typhoid fever.

14. Studies in Typhoid Fever, Johns Hopkins Hospital Reports, Series 3, pp. 229-230.

15. In the cases reported general anesthesia was always used in preference to local anesthesia, unless there was some special contraindication.

16. Quoted from Finney, Johns Hopkins Hospital Reports, vol. viii, p. 56.

17. Curschman and Osler, op. cit., p. 235.

Cases 1 to 7 and 9 have already been published in Mount Sinai Hospital Reports, 1903, vol. iii, pp. 104, 75, 383, 207, 208, 384, and hence the histories are omitted. The details will be found in the chart.

CASE 8.—*Typhoid fever; moderately severe course of long duration; symptoms of perforation on forty-third day; spontaneous recovery.*

Patient.—Hyman B., aged 12, was admitted Oct. 2, 1902, to the service of Dr. Koplik, with a history of typhoid of ten days' duration. Among the early symptoms was abdominal pain, which was present at the time of admission. He had also vomited at different times.

Examination.—White blood count on the day after admission, 10,200. Widal positive in 1 to 50. The liver enlarged three finger breadths below the costal border.

October 8. Temperature approaching normal. General abdominal tympany, but lax. Leucocytes, 5,000.

October 11. Slight abdominal pain on pressure in the right iliac fossa; soon passed off. Lower border of the liver at the free border of the ribs.

October 27 (thirty-fifth day). A sudden short rise of temperature to 104 F.; pulse, 110 to 120; leucocytes, 7,000.

The following week the temperature gradually fell, reaching 99 F. on November 2. General condition good. Pulse 90 to 104; respiration, 24.

November 4 (forty-third day). Morning temperature, 99.1 F. At 4 p. m. he complained of sudden severe abdominal pain at the umbilicus; abdomen rigid and general tenderness, especially in the right iliac fossa. Temperature, 100.2 F.; pulse, 104; respiration, 24; leucocytes, 14,000. At 4:30 p. m. vomited. At 6 p. m. temperature, 102; pulse, 116 to 128. Expression anxious; condition of the abdomen unchanged. Rectal examination showed tenderness in Douglas' pouch. At 8 p. m. the temperature had fallen to 99.8; pulse and respiration remain 104 and 24. At 9 p. m. temperature rose to 104; pulse, 124; respiration, 32. Condition of the abdomen the same. Liver dullness unchanged.

November 5. Midnight temperature, 103.8; respiration, 32; pulse, 128. Abdominal pain was the same; no vomiting. Liver dullness reached from the sixth rib to just above the free border. Abdomen was slightly distended, rigid and with a tender area in the right iliac fossa. Temperature during the day ranged between 103 and 104.4; pulse kept about 120; respiration varied from 26 to 38, superficial. Leucocyte count at 10 a. m. 12,200. At 3 p. m. he still had abdominal pain. Liver dullness was half gone in the middle line. Abdomen rigid; slight dullness in both flanks.

November 6.—Temperature, which had reached 104.4 at 6 a. m., gradually fell during the day, being 103 at 3 p. m., 101 at 9 p. m., and 99.8 at midnight. The pulse rose to 148 at 6 p. m. and then rapidly fell to 130 at midnight. Respiration, 26 at 6 a. m., 36 at noon, 38 at 6 p. m., and fell to 28 at midnight. The abdomen became more distended and was very tender. Liver dullness remained the same; no friction sounds could be heard. Throughout the day the patient's condition remained unchanged, the face being very anxious and the general impression being that of a child who was desperately ill.

November 7. Both pulse and respiration gradually fell during the course of the day, temperature dropping from 101 at 3 a. m. to 98.6 at 6 p. m. Pulse from 110 at 3 a. m. to 72 at 6 p. m. Respiration ranged from 26 to 24. Blood count at noon was 5,800. General condition better; quality of the pulse decidedly improved. Abdomen, especialy the right iliac fossa, being less tender. Dullness in both flanks still persisted; liver dullness remained unchanged. He passed a stool voluntarily.

November 8. Temperature normal. Abdomen less distended; very little tenderness of the right iliac fossa; liver percusses to the free border; leucocytes, 7,000.

Subsequent course of the disease was uneventful; discharged on December 10.

The case attracted a great deal of attention, owing to the fact that the parents refused to have an operation performed, and I am indebted to Dr. Koplik for the privilege of observing the course of this spontaneous cure of a perforation.

As to the occurrence of a perforation on the afternoon of the forty-third day there can be absolutely no doubt, since the presence of pain, rise in temperature, pulse and respiration range, the increase in the number of leucocytes, the occurrence of abdominal distension, the characteristic pain in the right iliac fossa, the tenderness and doughiness of the pouch in the rectum, the partial obliteration of the liver dullness, the dullness in both flanks and the change in the patient's condition, constitute a group of clinical phenomena for which no other explanation than that of perforation with peritoneal effusion can be found. This diagnosis is strengthened by the subsequent disappearance of all these signs.

CASE 10.—*Typhoid fever; severe course; perforation on eighteenth day; operation; death.*

Patient.—Samuel H., aged 38, Russian, was admitted on Jan. 28, 1903, on the fifteenth day of his disease. Markedly alcoholic history.

History.—He had been in bed a few days at a time until three days ago, when he remained in bed constantly. There was obstinate constipation.

Examination.—On admission his condition was apathetic. Abdomen tympanitic, somewhat distended, moderate rigidity, no tenderness, no roseola. The liver dullness extended to the free border. Bronchitis. General condition poor. Temperature, 104.4 F.; pulse, 118; respiration, 28. At 3 p. m. temperature rose to 106, but dropped to 104 F. at midnight. Leucocyte count, 8,400.

January 29. Temperature ranged from 104 to 105.4 F.; pulse between 90 and 104; respiration between 24 and 34.

January 30. Patient decidedly worse, temperature suddenly rising at noon to 107; pulse, 120; respiration, 38. Widal remained negative. At 6 p. m. temperature, 106; at midnight, 105.4; pulse, 120; respiration, 40.

January 31. At 4:30 a. m. he complained of severe generalized abdominal pain with marked rigidity and tenderness, both being more marked on the right side and especialy in the iliac fossa. Complete obliteration of liver dullness anteriorly; dullness of upper border of liver in axilla became tympanitic when the patient was turned on his left side. Respiration thoracic and had fallen to 34, but soon rose to 48. Temperature fell to 104, pulse to 112. At 9 a. m. temperature, 105; pulse, 148 and very weak; respiration, 48. Leucocyte count, 5,800. The abdominal signs unchanged.

Operation.—Consent for an operation having been obtained, patient was transferred to Dr. Liliendal's service for operation. Free fecal fluid in peritoneal cavity; perforation found in lower ileum and sutured.

Patient died eight hours after the operation. No autopsy.

CASE 11.—*Typhoid fever; moderate course; perforation on tenth day; no operation; death.*

Patient.—Joseph C., aged 13, American, was admitted to the children's service July 17, 1903, with a history of typhoid fever of one week's duration. Bowels normal; has had slight pain in the abdomen since onset.

Examination.—The attack was of moderate severity. Positive Widal, 1 to 50. White blood cells, 5,200; hemoglobin, 75 per cent. Abdomen retracted and tympanitic, except in the rigid area over the right upper rectus, where there was some dullness; rigidity of right upper rectus, tenderness in the right iliac fossa. The liver extended from the fifth space to the free border in the mammillary line, and in the anterior axillary line from the sixth space to one finger's breadth below the free border. Spleen palpable; a few roseola. Temperature, 103.8 F.; pulse, 120; respiration, 30.

Treatment.—Plunge on the first day was badly borne and only one given, sponges being used thereafter.

July 19. At 9 a. m. temperature dropped to 100.4, pulse remaining stationary at 110; respiration, 24. At noon, white

blood cells, 9,400. In the evening the temperature rose to 103.4, respiration to 52, pulse to 144, fair quality. No vomiting. Liver dullness not obliterated; abdomen tympanitic except dullness in the left iliac fossa. Flexion of the left thigh caused pain. The breathing is thoracic and superficial.

July 20. General condition unchanged and physical signs as last noted. The temperature at noon had dropped to 100.8, pulse to 128; respiration remained stationary at 48. White blood count, 10,600. At 9 p. m. the temperature rose to 102.4, pulse to 140, respiration to 56.

July 21. General condition the same; abdomen still tense, slightly distended and tender, especially in the left iliac fossa. General tympany, except dullness in the left iliac fossa. Liver dullness in the mammillary line obliterated up to two fingers' breadths above the free border of the liver. In the axillary line dullness from the eighth space to the free border. Lies with thighs flexed. Thoracic breathing; vomits occasionally; bowels respond slightly to enemata; rectal feeding begun. The temperature dropped to 100.6 at 9 a. m., but rose to 102.8 in the afternoon. Pulse kept between 130 and 140. Respiration, which had fallen to 36 in the morning, in the afternoon and evening kept at 52. White blood count at noon, 11,200.

July 22. General condition worse. Extreme thirst; tongue dry and coated; vomits everything. Lies with flexed thighs. Abdomen is tense, slightly distended, especially in the lower half; dullness in the left iliac fossa. Tympany over the liver is one finger's breadth higher than noted yesterday.

July 23. Grew progressively worse. The vomiting was incessant; the abdomen was less rigid but still tender. The liver dullness remained as last noted. The temperature, which had remained at about 100.5 on July 22, fell to 98 at 9 a. m. on July 23, and rapidly rose to 104.8 at midnight; pulse oscillated between 150 and 160; respiration between 36 and 48. Died July 24, 2 a. m. No autopsy.

Comments.—The clinical picture of this case was that of perforation, which probably occurred on July 19. Operation was proposed on that day, but consent could never be obtained.

CASE 12.—*Typhoid fever; mild course; perforation on fifteenth day. Admitted with perforation; operation thirty hours (?) after perforation. Recovery.*

Patient.—Harry R., aged 7, American, admitted to the surgical service on Aug. 6, 1903, with a history of typhoid fever of two weeks' duration.

History.—He had really been very ill only for twenty-eight hours before admission, the history being that of an acute onset of severe burning pain in the abdomen, then general cramplike pains, which were most marked on the right side of the abdomen. Vomited once after eating; bowels moved slightly after an enema. Two chills, one at onset and one four hours after the enema. Eighteen hours before admission the child's temperature was 104. These were the only details that could be obtained from the physician who had attended the child before admission to the hospital.

Examination.—On admission the child's general condition was poor. He was somnolent, but when aroused the expression was anxious. Heart and lungs negative. Abdomen was generally distended, rigid, tense and tender, the tenderness being most marked in the right iliac fossa; movable dullness in the flanks; no mass palpable. The liver and splenic dullness was obscured by tympany and rigidity. Rectal examination negative. Temperature on admission was 100.4; pulse, 120; respiration, 22.

Operation.—Patient was admitted at noon and operated on at 2 p. m. by Dr. Elsberg; cloudy fluid was found in the peritoneal cavity. A perforation was found twelve inches from the cecum; the neighboring intestines were covered with fibrin for from three to four inches above the perforation. The perforation was sutured. The appendix was removed but found normal. The peritoneal cavity was irrigated with normal saline solution and the wound sutured.

Shortly after the operation temperature rose to 103.4, pulse to 146, respiration to 44. The subsequent history was that of a rapid convalescence, temperature reaching normal on August 8, the third day after the operation and the seventeenth day of the disease. A positive Widal was obtained on the day after admission, on which day the leucocytes were 10,900.

He was discharged cured Oct. 3, 1903.

CASE 13.—*Typhoid fever; moderate course; perforation on twenty-seventh day; operation five hours later; death from perforation of another ulcer.*

Patient.—Becky B., aged 9 years, American, was admitted on Sept. 11, 1903, to the children's service with a history of typhoid fever of eight days' duration. Constipated. The disease ran a course of moderate severity. Leucocyte count between 6,000 and 7,000; hemoglobin between 75 per cent. and 65 per cent. Temperature began to fall on September 28, the twenty-fifth day of the disease.

September 30. Child takes nourishment poorly; slight distension; vomiting. Liver dullness extends from the fifth space to the free border. 6:20 p. m., complained of pain when position was changed; nauseated one hour ago; legs flexed on abdomen; abdomen more rigid and tender, especially on the right side, being most marked in the iliac fossa, where there is dullness, the rest of the abdomen being tympanitic. Dullness in the right flank which is not movable. Liver percusses to the costal border. The temperature, which had been 104 at 1 a. m., and had dropped to 100.8 at 11 a. m., was 102.2 at 3 p. m., 102.6 at 6 p. m., and 105 at midnight. Pulse at 1 a. m., 134; at 3 p. m. and 6 p. m., 108. Leucocytes, 10,600. At 7:30 p. m. the patient went into collapse.

Operation.—At 10:45 the patient, having responded to stimulation, was sent to the operating room, where laparotomy was performed by Dr. Elsberg and a large quantity of yellowish fluid found. Four inches above the ileocecal junction a perforation was found and sutured. There were three other suspicious ulcers within the foot of gut above the ileocecal valve. Irrigation with normal saline solution. Dr. Libman reported bacterium coli in the peritoneal fluid.

Result.—Death occurred twenty-four hours later with marked abdominal distension and rise of temperature, which had fallen after the operation. Twelve hours after the operation the patient seemed to have rallied, but this change was only temporary.

Autopsy.—An ulcer was found through which feces and gas escaped; general peritonitis; fibrinous exudate on coils of bowels; moderate amount of purulent peritoneal fluid; sutured perforation intact; other organs showed the usual lesions of typhoid fever.

CASE 14.—*Typhoid fever; walking case; perforation on thirty-first day; operation six hours later; recovery; normal temperature in nine days; long and severe relapse with hemorrhages, severe myo-endocarditis; recovery.*

Patient.—Jacob F., aged 19, Austrian, admitted on Sept. 18, 1903, to male ward I, with a history of typhoid fever of four weeks' duration, but he had only gone to bed six days before. Diarrhea, four or five stools a day.

Examination.—On admission temperature, 104; pulse, 132; respiration, 26. Positive Widal; white blood count, 8,200. Abdomen lax, tympanitic; roseolæ on chest and back. Hemorrhagic eruption over the right tibia. Liver extends from the sixth rib to one finger's breadth below the free border. General condition good.

September 21, 4 a. m. Complains of sudden, sharp, sticking, cramplike pain in the lower abdomen, most marked in the right iliac fossa. Temperature rose from 102.2 to 105. Slight chill. Temperature 105 at 5 a. m. Pulse rose from 90 to 120. Looks somewhat worse, being distinctly sicker, crying out with pain, which is continuous with exacerbations. Rigidity and tenderness in the right iliac region; nothing palpable; no other rigidity. Some tenderness in the left iliac fossa. Whole abdomen tympanitic. Liver dullness extends from the fourth space to two finger's breadths above the free border, where there is tympany. No obliteration of liver dullness in axilla. Slight abdominal distension, most marked in epigastrium. Respiratory movements present in abdomen. Respiration causes pain. Resists flexion of legs. No sweat. 7 a. m., general condition the same. Tongue dry; no change in temperature or pulse rate. Quality of pulse very good. Rigidity very much increased in

right iliac fossa and extends upward to free border of ribs. Rigidity in left iliac fossa as high as umbilicus. Liver flatness obliterated anteriorly as high as tenth rib (tympany). Flat and dull area in axilla over liver became tympanitic with patient on left side. No signs of fluid. Pain somewhat diminished. 9:30 a. m., condition the same. Temperature, 105.6. Transferred to second surgical service and operated on by Dr. Elsberg.

Operation.—Laparotomy disclosed a moderate amount of cloudy serous fluid. About eight inches from the ileocecal valve a perforation was found and sutured. About a foot further on there was a suspicious ulcer which was also sutured. The abdominal cavity was flushed with normal saline solution and closed. The peritoneal fluid contained the bacterium coli.

The patient made an uninterrupted recovery from the operation except for some vomiting and distension, the typhoid fever running its course and the temperature coming down to normal on September 29. On September 30 began a severe relapse.

Relapse.—October 5, patient had a hemorrhage and was sent back to the medical service with a sinus due to infection of the abdominal wall. No further hemorrhages. Relapse exceedingly severe owing to the fact that he suffered from a severe myocarditis superadded to an old endocarditis. For eight days (up to October 13) patient was *in extremis*, the pulse being exceedingly poor in quality and very irregular, both in rate and force, at times being imperceptible for hours. After eight days the cardiac condition improved and the temperature fell to 98.8, immediately shooting up again to 103, where it remained until October 17, when it became normal. The patient was discharged cured Nov. 4, 1903.

CASE 15.—*Typhoid fever; very severe course; profuse hemorrhages; perforation on twenty-fifth day; no operation; death.*

Patient.—Abram L., aged 30, Austrian, admitted on Sept. 26, 1903, to male ward I, with a history of typhoid fever of two weeks' duration.

Examination.—His general condition on admission to the hospital was poor. Temperature, 105.6; pulse, 120; respiration, 30. Liver extends to the free border. Abdomen somewhat distended and tympanitic; no rigidity. Positive Widal, 1 to 50. White blood cells, 8,600. The case ran an extremely severe, septic course with marked delirium, subsultus, etc. Moderate diarrhea; fairly marked distension of abdomen but no tenderness.

This severe toxemia continued until October 5 (twenty-fourth day) when, at 9 a. m., he had an intestinal hemorrhage of about four ounces. Temperature dropped from 104.4 to 101. Pulse rose from 94 to 114. White cells, 4,900. Abdomen soft; no tenderness, no rigidity. Liver percusses to the free border. At 8 p. m., temperature, 103.4; pulse, 110; white cells, 4,500. In the afternoon a subcutaneous gelatin injection was given and a gelatin enema was also used.

October 6. During the night had two hemorrhages, about a pint altogether. Temperature fell from 104.4 at 3 a. m. to 99.2 at 3 p. m. The pulse dropped from 110 to 82; respiration the same as yesterday, 32. White cells, 5,800 at noon; 5,400 at 6 p. m. During the day the patient's condition became worse; abdomen somewhat distended but not tender; liver dullness obliterated for three finger's breadths above the free border; flatness beginning at the sixth rib; dullness not obscured in the axilla. At 6 p. m., abdomen not distended, but somewhat rigid, especially in the right iliac fossa. Respiratory movements absent in the upper part of the abdomen, with general tenderness, especially in the lower half. Liver dullness decreasing in the mammillary line, reaching to fifth rib, but not obscured in axilla. No nausea, vomiting, chill nor leucocytosis, the count at 6 p. m. being 5,400. Temperature between 99.2 and 102.2; respiration, 38; pulse between 90 and 100. The symptoms gradually increasing, a perforative peritonitis was diagnosed, but operation was not permitted.

October 7. Eight a. m., condition worse; hippocratic facies; marked subsultus; cold sweats; pulse, 120; respiration, 35; temperature,100.6; white blood cells, 5,000. Vomited for the first time, the vomitus being brownish. Abdomen is more distended, with greater tenderness in the lower half; liver tympany reaches fifth space in the mammillary line, being two finger breadths higher than yesterday. Spleen entirely obscured. Respiration thoracic. Much flatus expelled through rectal tube. At 9 p. m. temperature fell to 98.6; respiration, 38. This improvement was of temporary duration only, for the pulse, respiration and temperature rapidly rose and the patient died at 1 a. m. on October 9. No autopsy.

CASE 16.—*Typhoid fever; severe course; perforation on twenty-third day; operation; death.*

Patient.—Jacob C., aged 16, Austrian, was admitted to the male ward I, Oct. 27, 1903, with a history of typhoid fever of insidious onset and of twenty days' duration. He took to bed twelve days previously on account of chill, severe headache, fever and abdominal pain; he also had profuse sweats and from five to six diarrheal movements daily.

Examination.—On admission general condition only fair; delirious; abdomen generally tympanitic; slight tenderness, but no rigidity. Liver flatness in the mammillary line extends from the seventh space to the free border edge, being just palpable. Spleen palpable. Temperature, 105; pulse, 100; respiration, 26; white blood count, 11,600. Widal positive, 1 to 50.

October 29. At 6 a. m., general condition not so good. Abdomen slightly distended and tender, especially in the right iliac fossa. General tympany; liver dullness obliterated in the axillary line, in the axilla flatness to the free border. The temperature, which had fallen from 104 at 3 a. m. to 101.8 at 6 a. m., rose to 104 at noon; pulse, which had remained at 88, rose to 100 at noon, and respiration rose from 23 at 6 a. m. to 37 at noon. 6 p. m., no special change in the patient's condition, but it is noted that there is increased abdominal rigidity; no distension; no pain, but slight general tenderness; no vomiting; no chill. Liver dullness at the fourth space in the mammillary line; in the axilla sixth space. Temperature remained steady at 104.5, but the pulse rose at 6 p. m. to 130, dropped to 102 at 9 p. m., and rose to 124 at midnight. Respiration, which had fallen to 28, rose to 37 at midnight. No special character about the breathnig. Leucocyte count at 9:30 p. m., 11,700.

October 30. Signs the same with the exception that there was a little more distension and there was dullness in the left flank. Diarrhea.

Operation.—Diagnosis of perforation having been made, he was transferred to the service of Dr. Lilienthal, who operated at noon and found a perforation low down in the ileum, covered with omentum; fibrinous adhesions; no free gas nor feces in the peritoneal cavity, only some cloudy serum. The perforation was sutured, but the patient never rallied after the operation. There was continuous vomiting and in spite of vigorous stimulation he died on November 3.

Note.—The exact time of perforation could not be determined in this case owing to the patient being delirious and to the vagueness of the onset of the symptoms.

CASE 17.—*Perforation at the end of the fifth week of typhoid fever; operation two days after perforation; evacuation of large fecal abscess; artificial anus; drainage; recovery.*

Patient.—X., aged 21, Russian, was admitted on Nov. 13, 1903. He had been ill with typhoid fever for five weeks, having been referred to the hospital by Dr. Alfred Meyer, who had seen him in consultation. The details of the history of his illness are very vague.

History.—Two days previously he had had an attack of severe general crampy abdominal pain; since then there had been severe general abdominal tenderness. No chill at onset; did not vomit and has not vomited since; has had no movement of the bowels even after an enema; no gas has passed.

Examination.—On admission his general condition was fair and he certainly did not give one the impression of a patient who had a large quantity of purulent fluid in his abdomen, as was afterward found at the operation. The abdomen was generally tympanitic, tender and distended; the lower border of the liver and spleen obscured by tympany; there was movable dullness in both flanks. Temperature on admission, 100.2; pulse, 120; respiration, 26; white blood count, 9,000.

Operation.—He was immediately operated on by Dr. Moschcowitz. There were adhesions of the coils of gut to the abdom-

inal wall, collections of foul, yellow pus being found between the coils; there was a large abscess in the pelvis and a perforation the size of a quarter of a dollar was found in the ileum and sutured. The edge of the perforation was sutured to the peritoneum, the abscess was drained with a tube, and the rest of the wound closed in layers.

Result.—November 14. The temperature, which had arisen to 104 nine hours after the operation, fell to 99 in twenty-six hours. His convalescence was uninterrupted. The artificial anus was subsequently closed and the patient left the hospital cured in the middle of December.

CASE 18.—*Typhoid fever; walking case; perforation on thirty-fifth day while on bed-pan; operation six hours later; death.*

Patient.—Samuel L., aged 24, was admitted Dec. 14, 1903, to male ward I, with typhoid fever of three weeks' duration. For two weeks he had taken cathartics for the constipation a number of times, the last cathartic being taken two days before admission. Has been in bed for only two days. Fever has only been marked since the day before admission. Has complained of abdominal pain for two days.

Examination.—On admission temperature, 102; shortly after that he had a severe chill, after which the temperature rose to 105. Abdomen is lax, no distension, no tenderness. Liver dullness to the free border, not palpable. Widal positive, 1 to 50.

The course of the disease was severe. Various blood counts between 5,000 and 6,000. Abdomen was scaphoid; no tenderness.

December 26. Patient improving; temperature beginning to fall, ranging between 102 and 103; leucocyte count, 6,000; abdomen negative.

December 27. At 4:30 a. m., while the patient was on the bed-pan, he suddenly experienced a severe abdominal pain which caused him to cry out. This lasted only a short time and when seen fifteen minutes later he was quiet. Pulse, 100. Abdomen somewhat scaphoid and soft, but with slight rigidity over the lower part of the right rectus muscle. Patient lies with thighs flexed; tenderness in the lower half of the abdomen, especially on the right side. General tympany; tympany over the liver two fingers' breadth above the free border in the mammillary line; no axillary tympany. Breathing thoracic and upper abdominal. Temperature at this time, 102.8; pulse, 100; white blood count, 6,600. At 6:30 he had another attack of pain. Pulse rose to 116. At 9 a. m. patient's general condition was the same; had one stool which contained no blood. No nausea, vomiting, chill nor collapse. Pulse of fair quality; temperature has fallen to 101.6. Rectal examination negative.

Operation.—At 10:45 a. m. he was operated on by Dr. Gerster; duration of operation, 45 minutes. Free fluid was found in the peritoneal cavity, but no free gas or fecal material; no peritonitis; no injection of intestine. A small perforation was found in the lower ileum surrounded by a necrotic area and was closed by Lembert suture. No other perforation was looked for on account of the poor condition of the patient at this time, pulse being 160 and of poor quality.

Following the operation the temperature rose to 105.6, then fell rapidly. Pulse after the operation, 132, and respiration, 32.

December 28. Temperature has fallen to 96.2; pulse, 82; respiration, 22. No nausea nor vomiting, but complains of some abdominal pain, with slight distension and tenderness in the epigastrium. Liver flatness obliterated from the sixth space downward in the mammillary line. In the afternoon there was hiccough; vomited once in the evening; bowels moved during the day. In the evening pulse grew more rapid and feeble. Patient died at midnight.

Wound Examination.—A sutured perforation with sutures intact was found in the ileum ten inches above the cecum and a second perforation beyond this, this being protected by the adherence of the omentum. No peritonitis present.

CASE 19.—*Typhoid fever; walking case; admitted with perforation, which had occurred on fifteenth day; operation forty-eight hours later; fecal abscess drained; recovery.*

Patient.—Jacob M., aged 25, Russian, admitted to male ward 2, Dec. 10, 1903, with a history of walking typhoid of two weeks' duration.

History.—Stopped work two days before admission because he felt "sleepy," but did not go to bed. Had one watery yellow stool each day. No abdominal pain until the day before admission, when he had severe, sudden sticking pain in the lower abdomen on both sides, which caused him to go to bed. Was chilly, vomited some watery fluid at the onset of the pain. The vomiting persisted every fifteen minutes. That night he was seen by a physician, who found a temperature of 106; pulse, 120. At 5 a. m. on the day of his admission the pain and vomiting had abated.

Examination.—On admission to the hospital at 9 a. m. his general condition was good. Temperature, 105.2; pulse, 110; respiration, 26; white blood count, 14,200; negative Widal. Abdomen retracted and tender, especially on the left side; walls rigid and tympanitic. Dullness in the left flank; dull tympany in the right flank, but no change with change of posture. Liver dullness begins at the fourth space; no flatness; tympany begins three fingers' breadth above the free costal border in the mammillary line, the same in the axillary line. Spleen, in axillary line, dullness at the sixth rib, becomes tympanitic four fingers' breadth above the free border. Rectal examination: On the left side, high up, a small, irregular mass which was not hard nor tender, could be felt.

Urine: Trace of albumin, hyaline casts, a few blood cells.

After admission he twice vomited bile-stained fluid and the abdomen became more distended. There was an elliptical area of tenderness the size of an orange in the left iliac fossa midway between the symphisis and the umbilicus. The tympany over the liver had risen two fingers' breadths above the line first noted.

Operation.—There was delay in obtaining consent for operation, which was not performed until 6 p. m. by Dr. Lilienthal. A median incision was made below the umbilicus, two and one-half inches long. To the left of the median line, corresponding to the area of tenderness above noted, a large fecal abscess was evacuated. No further exploration was made. Tube drainage.

The further course of his disease was that of a severe typhoid.

December 11. Condition of the patient worse; temperature ranged between 102 and 103. Frequent vomiting, but no abdominal tenderness except over the wound. Slight icterus. Leucocytes, 13,600; negative Widal. Hypostasis at both bases.

December 13. Leucocytes, 7,100.

December 14. Leucocytes, 7,400. Vomiting has ceased. He now takes nourishment by mouth. Temperature range, 102; general condition better.

December 15. Temperature still high. No rectal mass to be felt.

December 21. Still running continuous temperature between 102 and 103; general condition fair. Fecal fistula persists; granulations healthy. Repeated Widal tests having been negative, a blood culture was made by Dr. Libman, who reported the presence of typhoid bacilli in the blood. The first positive Widal, 1 to 50, was reported five days later, December 26, the thirty-first day of the disease. It remained positive thereafter.

The further course of his disease was complicated by a pneumonia and a right otitis which required perforation.

Temperature reached normal on January 12. The fecal sinus closed at the end of January, when he was discharged cured.

DISCUSSION.

DR. WILLIAM OSLER, Baltimore, stated his opinion that one of the most important and essential things in these cases is intelligent watchfulness on the part of the physician looking for changes in the patient's condition in typhoid fever. In hospital practice this is easy; there the specific things the house physician should look for in typhoid fever can and should be explicitly stated in writing. The physician should be kept on the *qui vive* looking for these changes and should be ready to report them promptly to the attending physician within ten

minutes after they have been noted. Dr. Osler also emphasized the need for the prompt co-operation of the surgeon. In general hospital cases there is not time to call the attending surgeon and, therefore, when the case has been carefully studied and diagnosis of perforation made, the house surgeon should immediately operate. The last case at the Johns Hopkins Hospital, he said, illustrates the importance of this. A strong, robust German, in the tenth or eleventh day of the disease, at 12 o'clock was suddenly seized with pain in the abdomen. He was seen by Dr. McCrae and was also carefully watched by the resident surgeon. He was operated on at 3 o'clock. The interesting thing was that the operation seemed to make no difference in the progress of the case. The perforation was found, was fixed and the patient made an uneventful recovery from a very severe attack of typhoid fever. The records of 19 cases with perforation that were operated on show that 7 recovered, which is an average of 33 per cent. and is as good as can be expected in a general hospital where the very severe cases are received, sometimes even with perforative peritonitis.

DR. J. C. WILSON, Philadelphia, said that one of the rules that he gives the resident physicians, particularly in the German and Pennsylvania hospitals, is to ascertain the conditions as regards rigidity as a mater of routine at every visit. The mere suspicion of rigidity of the right side, at the right lower quadrant of the rectus muscle, requires a report at once to the general physician. Pain, particularly if with rigidity, should make the physician notify the surgeon to come prepared to operate, and the patient should be made ready to go to the operating room without waiting for the coming of the surgeon. That is one of the most important points regarding the routine management of enteric fever from the standpoint of early diagnosis of perforation. On the other hand, said Dr. Wilson, in several cases sudden intense pain occurred on the right side of the abdomen, in the iliac region, with rigidity of muscles, but with very little constitutional disturbance; in a few hours these symptoms passed away and the patient was left apparently as well as previously. There was no perforation and he was at a loss to account for it. Dr. Wilson is strongly of the opinion that hemorrhage and perforation very rarely occur at the same time, but he thinks that hemorrhage is not rarely a precursor of perforation and, therefore, that a vigilant watching is very necessary. The time has come for the profession seriously to consider opening the abdomen to stop the bleeding.

DR. MORRIS MANGES, New York, agreed with Dr. Osler's points and said that the whole trouble of diagnosis in typhoid perforation in the early stages is that the general practitioner wants too much for diagnosis.

EARLY DIAGNOSIS AND OPERATIVE TREATMENT OF GASTRIC CANCER.

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The hopelessness of pyloric cancer, or, indeed, of any form of gastric cancer when the diagnosis has become so plain that "he who runs may read," and the possibility of affording prolonged or even permanent relief if timely surgical interference could be advised, makes its early diagnosis of paramount importance. Unfortunately, it is one of the most difficult chapters in internal medicine, and it must be confessed that we are to-day without a single pathognomonic sign of early pyloric or other gastric cancer. The fact is that in most cases of gastric cancer, as in many other chronic diseases, the initial stages are practically symptomless. Symptoms, however, usually supervene at a comparatively early stage, and many of these cases would have a possible chance for more or less successful surgical treatment if these symptoms were given proper consideration and the patient placed under the care and treatment of a physician skilled in gastric disorders. In general, it may be said that any case of progressive and intractable stomach disease, especially if developing in an otherwise healthy patient, or even in a patient who has had a very prolonged but comparatively slight digestive disorder, should not be allowed to continue more than five or six weeks without an accurate diagnosis being made by a competent physician. It is possible that at such an early stage the only thing that can be determined is an existing gastritis; but the character of the secretion and the motility of the stomach muscle can be determined and noted as a starting point for further observation of the case. Later, if the patient does not improve with favorable environment and proper local and general treatment, but instead grows progressively worse, there comes a time when an exploratory laparotomy should be advised for the two-fold purpose of determining the presence or absence of a neoplasm and its removal if present. Just when this point arrives can not be decided by any fixed rule, but is a matter of clinical judgment in the individual case under consideration. It must be decided on the basis of all available facts concerning the chemistry of digestion, the débris of the fasting stomach, general nutrition, metabolism, etc., no one of which will be sufficient to make out a very strongly probable case, but which taken together may create a suspicion so strong as to warrant, or even to demand, that the patient be offered an exploratory procedure.

It may be said that the results of pylorectomy for cancer have not been sufficiently good to justify the procedure. If this is true, and it is easily debatable, it is because the diagnosis has not been made sufficiently early. Physicians have not been willing to take the responsibility of advising an exploratory laparotomy while the case remains in doubt, and this procedure is necessary if therapeutic results are to be obtained. There is no doubt whatever that cancer is primarily a local disease, and that if it can be sufficiently early recognized and eradicated by free incision, a permanent cure may reasonably be expected. It seems to me that it is our duty, therefore, to be on the alert and to advise operation at what seems to be the proper moment. It is simply a question of clinical judgment as to when such a procedure is justifiable, and if any serious attempt is made to meet these questions in the manner indicated, it must now and then happen that a mistaken exploration will be made. This, however, with the perfect technic of present abdominal surgery and the practically complete absence of mortality in simple exploratory procedures, is not a matter to be dreaded so much as the possibility of permitting a case of incipient cancer to pass the operative period.

The following case, as the history will show, was operated on too late, although the operation was advised immediately after my examination. It was postponed about two weeks by circumstances connected with the patient, but this, of course, did not substantially change the conditions, which were obviously far beyond radical operative relief.

Patient.—Mr. B., aged 40, laborer, was referred to me by Dr. R. E. Brokaw, Portland, Ind., Sept. 1, 1904.

History.—The patient complained of indigestion beginning seven months previously, although for several years there had been a slight disturbance of gastric digestion. The first symptom referable to his present condition was a pain occurring in the region of the stomach with occasional vomiting coming on without reference to meals. This had grown progressively

with, however, periods of exacerbation and of amelioration. The bowels were constipated and there was considerable flatulence, mostly referable to the region of the stomach, which was the cause of more or less pain. He said that at times there was a large transient swelling in the left epigastrium which was very painful, and on manipulation gave rise to gurgling sounds and finally would disappear with a sound of a splashing or gushing character.

Examination.—The general nutrition had been somewhat impaired. His weight in health was from 135 to 140 pounds, and at the time of my examination was 119 pounds. Physical examination was negative except that I thought I could distinguish, in the pyloric region, a small, hard nodule, tender on pressure, but quite movable, but this was not very distinct. Analysis of a test meal (Ewald test breakfast) showed 50 degrees of free HCl, total acidity of 150 degrees, strong biuret reaction, with very little unchanged starch. No lactic acid. The fasting stomach contained a dirty brownish fluid with large quantities of mucus, leucocytes and broken-down red blood corpuscles. There was a slight, even doubtful, trace of lactic acid and numerous Oppler-Boas bacilli. The blood examination showed 50 per cent. of hemoglobin, 3,000,000 red cells and 7,000 leucocytes. Analysis of the urine revealed nothing unusual except fibrinuria. Examination with the cardiometer showed the distance from incisors to stomach to be sixteen inches and revealed a moderate dilatation of the esophagus for from four to five inches above the cardiac. A subsequent test meal showed 30 degrees of free HCl.

Diagnosis.—On the basis of the clinical history, physical examination and stomach analysis, a probable diagnosis of pyloric cancer was made and operation advised. Pyloric stenosis was positively diagnosed, the only question being as to its malignant or non-malignant character.

Operation.—The operation was performed two weeks later by Dr. Miles F. Porter, and a pyloric cancer of considerable size was found. There were secondary deposits in the gastrohepatic omentum as high as examination could be made, and it was decided to be too late for resection and a gastroenterostomy was made.

Result.—The patient made a good recovery, but, of course, will succumb within a few months.

The probabilities are that in such a case as this the symptoms began sufficiently early to make a radical procedure possible if we are only willing to act on a strong suspicion corroborated by careful and somewhat prolonged study of the case.

In another case, seen only two weeks before death, too late for any operative procedure, the symptoms had been pronounced for months, and yet, so far as could be determined, the disease was limited absolutely to the pylorus without any secondary deposits whatever, and in this case also there would have been an excellent opportunity for a radical extirpation of the tumor with a fair chance of permanent cure if action had been taken early.

What now are the clinical manifestations which will justify or demand an exploratory procedure in the interest of these cases in the future? From what has already been said, it is plain that any categorical answer can not be given to this question. In some cases, the disease is latent to so late a period that it is manifestly impossible even to suspect the existence of the disease during its early stage. In one of my cases, for instance, an elderly man consulted me on account of a slight indigestion of a few weeks' duration. I urged him to permit me to make a physical examination which he declined to do on that occasion, but insisted on my prescribing something for temporary relief, saying that he would permit me to make the examination later. He really appeared in fairly good health, and from his appearance I had not the slightest suspicion of malignant disease. About two weeks later, I was asked to call at his residence, and found that he had been vomiting typical coffee-ground material, and on placing my hand over the stomach found a tumor half as large as an orange. He died two or three weeks later. This man apparently was in his usual health until within five or six weeks of the time of his death. He had retired from business and his habits were not active, and this, perhaps, masked the debility which must have been present to a greater degree than was suspected.

In cases of gastric cancer occurring in stomachs previously normal, and in which the symptoms manifest themselves with more or less suddeness, a strong suspicion of malignancy should be entertained at once, and only sufficient time taken in the study and observation of the case to establish its progressive character. It must be remembered that in such a case the onset of symptoms is not contemporaneous with the inception of the disease, but simply marks the point of development at which gastric function and perhaps general nutrition become impaired. The latent stage may be brief or long, according to the location, rapidity of development, and nervous organization of the individual case, and it is always possible that the first obtrusive symptom may not be very early. My own observation in regard to nutrition is certainly contrary to that of Krönlein, who mentions emaciation as the earliest symptom. Nutrition is likely to suffer slowly, soon after the development of positive symptoms, but in a large majority of my cases other symptoms, such as pain, vomiting, etc., have distinctly preceded emaciation. This, for instance, was true in the case reported in this paper. The patient was in his ordinary health seven months before, being referred to me without any perceptible diminution of weight or strength, and yet the symptoms arising at that time undoubtedly marked a more or less advanced stage of the pyloric cancer. This appears to me to be an important question, as too much stress is commonly laid on the state of general nutrition. There is no reason why a purely local disease involving the pyloric end of the stomach should impair nutrition and cause emaciation until it produces obstructive phenomena of some sort. There may even be improvement of nutrition after the development of symptoms referable to the local lesion, and more or less improvement of general health, but this, of course, will be transient in character. In the two weeks, for instance, which elapsed between my examination of the case recorded and his return for operation, he gained three pounds in weight, both weighings having been made either by myself or by my assistants in my own office, and careful reference being made to clothing, etc. It is undoubtedly true that in many cases emaciation is an early conspicuous symptom, but it should be fully recognized that there are many exceptions to this rule, if, indeed, it is the rule at all.

Stomach analysis, as a rule, will give only corroborative evidence. In fact, in the early stage which we are now considering, there are no exceptions to this rule, and the corroborative evidence itself may be slight or lacking. The absence of free HCl or the presence of lactic acid can not be assigned a high value in the diagnosis of gastric cancer, except as they corroborate other findings. Many cases are on record, like the one already reported, in which free HCl is present in normal quantities, and it is well known that it may disappear in simple gastric catarrh. The same remark applies to lactic acid which was really absent from the test meal

in this case, and is frequently present, as is well known, in certain forms of non-malignant disease. The Oppler-Boas bacillus is very frequently associated with gastric cancer, but it simply means a certain type of lactic-acid fermentation, and while I attach more importance to it than I do to the HCl and lactic-acid phenomena, it is only strongly corroborative, as I have found it in several cases which were undoubtedly benign in character, as proved by subsequent history, as have other observers also. Atypical mytosis, which was thought by Hemmeter and others to have considerable diagnostic value, is not distinctive. It is somewhat characteristic of rapid neoplastic formation, and if found with great frequency is entitled to some consideration in summing up the total findings.

The pain and vomiting of gastric cancer are in no sense distinctive, and may be duplicated in non-malignant disease. The anemia which is so marked in some cases is purely a secondary phenomenon, and the leucocyte count is not significant. Even absence of digestion leucocytosis only means that the products of digestion are entering the blood slowly, or that the reactionary power of the phagocytic mechanism is greatly impaired, and this could only be a late phenomenon and without value for our present purposes.

The prolonged retention of stomach contents, or as Einhorn calls it, ischochymia is a symptom of considerable value, and occurs rather early. It is simply an expression of gastric myasthenia, with possible pyloric obstruction, and may occur in other cases, and, moreover, it is not likely to be marked at a stage when diagnosis is most important and most desirable. Like the other symptoms, therefore, it is only corroborative, and it is undoubtedly true that many a stomach with fully developed cancer may have practically unimpaired motility and empty itself perfectly.

We can omit from our present consideration such phenomena as coffee-ground vomit and a well-defined tumor, cancerous fragments in washwater, etc., as they do not belong to the stage of the disease under discussion.

In summing up the diagnostic data, we are admittedly unable to place our fingers on a single symptom or analytical finding, the presence of which can be relied on to establish the diagnosis of early gastric cancer, and the absence of which can exclude it. This, perhaps, may be said to be true of any combination of several symptoms. This is unfortunate because of the impossibility of establishing a general diagnostic formula, but it does not justly express the possibility of the experienced and skilled diagnostician of establishing a probable diagnosis strong enough to justify surgical intervention. In fact, it is very largely a question of the individual case and the individual diagnostician. A few general propositions, however, may be set down even at the risk of repetition.

The earliest symptoms of gastric cancer are simply the manifestation of disturbed gastric function and may present almost any type of disturbance influenced, of course, by the location of the neoplasm, the rapidity of its growth, and the vulnerability of the muscular and secretory apparatus and the nerve centers, the original vigor of the digestive apparatus and the virility of the organism as a whole. As an initial symptom there may be pain in one case, vomiting in another, impaired secretion in another, and emaciation in still others. When a patient, therefore, presents himself with some form of gastric disturbance, the first information to obtain is an accurate history of its development, its duration, its progressive or unprogressive character, the state of the general nutrition, etc. The characteristic thing about the nutritional disturbance in gastric cancer is its slow development; it may, of course, be rapid, but this is probably exceptional. It is to be presumed that the external physical examination will be negative, although Mayo Robson says it is still not too late to attempt relief even if a palpable tumor is present. The next step is to secure the contents of the fasting stomach in the morning before breakfast; if there is no fluid, any detritus that is present should be secured by irrigation. A careful chemical and microscopic examination may throw some light on the diagnosis. The presence of lactic acid, of the Oppler-Boas bacillus, of the evidences of an associated gastric catarrh, and of broken-down blood cells are all more or less significant. An Ewald test breakfast should then be given, and the character of the digestive processes critically studied. The presence or absence of HCl, its amount if present, the intensity of the biuret reaction, or its absence, the presence or absence of the various enzymes are salient points here. The motor function, in some measure, will be determined at the same time, but should be studied further by an examination of the stomach contents at varying intervals after larger meals.

The summing up of all the data thus obtained will rarely, if ever, justify a prompt positive diagnosis of gastric cancer in the early stage. However, it usually will strengthen or dispel the suspicion, and will serve as a starting point for such further clinical study and observation of the case as the importance, obscurity and difficulty of the questions involved imperatively demand. This means that the patient should be continuously under critical study[1] and treatment, the therapeutic tests being of the utmost importance, although, as already indicated, they may prove temporarily misleading.

It is not my purpose to enter into an extended discussion of the operative treatment of gastric cancer, as this is entirely outside of my province, except as an observer of the work of others. One of the most discouraging points which makes the internist hesitate to advise radical procedures is the very large mortality attending gastrectomies. About one-third of all the patients die from the effects of the operation. This is a frightful mortality, and one which ought to be reduced if cases are taken to the surgeon earlier. Haberkant says that with extensive adhesions the mortality is 70 per cent., and without them, 27 per cent. We thus see that even without adhesions more than one-fourth of all the patients die from the effects of the operation. When we can be assured of a mortality of not over 10 or 12 per cent. in the absence of adhesions, and with a fairly good general condition, the operation can be urged on a patient with better grace.

It appears to me that gastrectomy should be the operation of choice, as gastroenterostomy is admittedly only palliative in character, and does not by any means offer the same degree of relief as a radical gastrectomy does. This is shown by the average duration of life after the two operations for gastric cancer. Patients live, on an average, after gastroenterostomy from three to four

1. The amount of time varies widely. In some cases three or four days is sufficient, in others three or four weeks or even longer. These latter cases are the ones in which suspicious tendencies occur and in which the influence of treatment on the stomach function is important. Ordinarily one or two weeks' time is ample.

months, after gastrectomy, more than a year. The reasons for this are sufficiently plain. When recurrence takes place after a gastrectomy, it is presumably from the secondary deposits which could not be removed, or because of an insufficiently wide excursion of the knife in removing the segment of the stomach. It is quite natural that these deposits should not develop so rapidly as the original active focus of the disease, probably in a state of disintegration on the mucous surfaces. Beside this, the hemorrhages and septic secretions from the ulcerating surfaces debilitate and poison the patient when a gastroenterostomy has been done, as no change whatever has been made in the local morbid process, and such benefit as does accrue is simply the result of better drainage of the contents of the stomach.

The question as to whether the presence of a palpable tumor makes it too late for surgical intervention is a most intensely interesting and practical one. It is probably true, in a vast majority of cases, that when the growth has reached a stage when it can be palpated through the abdominal wall sufficient metastases have occurred to make a complete removal impossible. In exceptional cases, however, this may not be true, and I have seen at least one case in which a somewhat doubtful palpable growth was apparently strictly limited to the pylorus without secondary deposits. Even if a radical cure can not be anticipated, the relief of from one to two years which should follow a gastrectomy would be worth while as a simple palliative procedure, could it be shorn of its terrible mortality. In conclusion, I wish to affirm with all the emphasis possible the fact which Riegel so forcibly points out, that if we are ever to get better results in dealing with gastric cancer, it will be when the internist acquires the diagnostic acumen necessary to enable him to strongly suspect malignancy, and possesses in addition the courage necessary to enable him to act on that suspicion before it becomes a certainty. In order that this may fairly be demanded of him, however, ample opportunity must be offered for study and observation of the case; and for this he is entirely dependent on the promptness with which the family physician recognizes the doubtful nature of the case and refers it for diagnosis. As a matter of fact, the primary responsibility really rests with the family physician who, in too many instances, treats obscure and intractable gastric disorders in a routine manner with only a faint suspicion of their real pathology, and who, in so doing, permits cases of malignant disease to drift supinely on until they enter that realm above whose portals may well be inscribed Dante's words:

"Abandon hope, all ye who enter here."

SOME COMPLETE URINE ANALYSES.

J. H. LONG.

CHICAGO.

A search through the chemical and physiologic literature will show that comparatively few complete analyses of urine, representing the full day's excretion, are on record. In the course of some other work, I found it necessary to make a number of lengthy determinations of this kind, and I present here the results obtained.

Beside the organic substances, urea, uric acid and creatinin, the urine contains essentially combinations of three inorganic acids and five inorganic bases. That is, there are combinations of sodium, potassium, ammonium, calcium and magnesium with hydrochloric, sulphuric, and phosphoric acids, the last two being largely products of oxidation metabolism. Some of the text-books of urine analysis and of physiology make rather misleading statements about the relations which exist between these substances and the limits within which they vary; and the old errors are still repeated in regard to the normal volume of urine excreted. It is the object of this paper to give some new and accurate data on these and on other points.

THE NORMAL VOLUME OF THE URINE.

Many of our standard data on physiologic chemical matters have been taken from German sources, and in so doing we sometimes make the error of accepting statements which can not be true under American conditions. The average daily liquid consumption here is much below that in Germany, while the consumption of solid foods is certainly higher. The average volume of from 1,500 to 2,000 c.c. of urine for the day is far too high for our conditions, while a specific gravity of from 1,015 to 1,020 is correspondingly low. Among our text-books, the recent work of Charles Simon, "Physiological Chemistry," is the only one I have examined carefully which makes a correct statement on these matters. I will add some figures of my own. In a series of 24 observations, in which the whole day's excretion of a number of men was saved, I found the average volume to be 1,167 c.c., with extremes of 765 c.c. and 1,950 c.c. The average specific gravity was 1,025 at 20 degrees, referred to water at 15 degrees as standard. In a second series of 24 examinations of the urine of vegetarians, a mean volume of 874 c.c. was found and a specific gravity of 1,030 under the same conditions. In a third series of examinations of male students, janitors and nurses, I found a mean volume of 1,221 c.c., and for the same number of urines from female nurses, I found a volume of 859 c.c. These results were secured in 1900 and in 1901. More recently still other collections from various sources have shown a volume of about 1,200 c.c. as an average, and this is certainly as high as should be taken for male urine.

In calculating the day's excretion for the specific gravity by the use of the Trapp or Haeser coefficient, these facts become of importance. In using these coefficients it must be remembered that they are based on a specific gravity at 15 degrees, generally, compared with water at the same temperature. At the present time, following a suggestion of Squibb, many urinometers are graduated for a temperature of 25 degrees, and usually without a statement as to the comparison water temperature.

CHEMICAL ANALYSES.

Six complete analyses have been made by methods which need but little explanation. The alkalies were separated from 100 c.c. of urine as pure chlorids, by the Bunge process,[1] and the presence of potassium was determined with platinum chlorid. Calcium and magnesium were found in 200 c.c., and ammonia in 50 c.c. by the Schloesing method, the result being corrected by a previously determined factor. Chlorin was found by the Volhard-Arnold process, the excess of silver used in titration being measured after filtration. Phosphoric acid was found by the uranium titration, with use of cochineal as an indicator. The total sul-

1. Neubauer und Vogel: Analyse des Harns, 10th ed., p. 738.

phates were found in 50 c.c. by precipitating with barium chlorid in the presence of excess of hydrochloric acid, the mixture being kept hot for eight hours on the water-bath. The precipitate is collected on a Gooch asbestos funnel, washed with water and then with alcohol. By using the right kind of dense asbestos it is not at all necessary to destroy organic matter in the urine by chlorate and hydrochloric acid before precipitating. The precipitate may be collected and washed without the slightest loss, and rapidly, too, if properly chosen asbestos is employed. This is preferable to any method by which a great deal of foreign matter must be introduced in the purification.

I found urea by the mercury method, correcting the results by the method I explained in a former article.[2] The amount of uric acid was determined by the Hopkins process, and the creatinin by the Neubauer-Salkowski process.

To secure amounts of urine large enough to work with, I took for each analysis the mixed urines of three individuals for the twenty-four hours, the excretion for the three averaging 3,600 c.c. in each case. Three analyses were made on urines of men in normal health who were consuming a mixed animal and vegetable diet. In another set of tests I used three mixed vegetarian urines, collected from several individuals in the same way. In these cases the amount of urine for each day was smaller, averaging about 1,000 c.c. for each person. The results are given below in grams per 100 c.c. Numbers 1, 2 and 3 are the ordinary urines, and Numbers 4, 5 and 6 the vegetarian.

I must add, in explanation of this, that the men furnishing these urines live exclusively on vegetable foods, and were students and teachers in the American Medical Missionary College, Chicago and Battle Creek. To show the effect of a vegetable diet, urine collected in this way is much more satisfactory than is urine from persons kept on such a diet for a few days for experimental purposes.

TABLE 1.
TABLE OF RESULTS. GRAMS PER 100 C.C.

	1	2		4	5	6
Specific gravity 20/4	1.024	1.020	1.026	1.017	1.028	1.021
Urea	2 85	2.60	2.97	2.11	2.95	2.80
Creatinin	0.175	0.179	0.1414	0.0232	0.0910	0.105
Uric acid ($C_5H_4N_4O_3$)	0.0641	0 0691	0.0876	0.0549	0.0769	0.0838
Ammonium, NH_4	0.0900	0.0840	0.1080	0.0800	0.0745	0.0576
Potassium, K	0.1980	0.2455	0.2604	0.1416	0.4872	0.3869
Sodium, Na	0.3820	0.3710	0.4647	0.3419	0.3578	0.2705
Calcium, Ca	0.0104	0.0086	0 0132	0.0031	0.0164	0.0130
Magnesium, Mg	0.0092	0.0121	0.0152	0 0144	0.0225	0.0341
Chlorin, Cl	0.7366	0.7160	0.7739	0.5274	0.8165	0.5893
Phosphoric acid, PO_4	0.1143	0.1742	0.3135	0.2062	0.3111	0.2230
Sulphuric acid, SO_4	0.1640	0.1964	0.3230	0.1965	0.2790	0.2039

It will be observed that there is great difference in the composition of these urines, and that there are wide limits in the relation of potassium to sodium. Table 2 shows the relation of the basic substances to the inorganic acids present, and for this purpose the combining power of the bases is expressed in terms of sodium and the acids in terms of chlorin.

In Table 2 the phosphates are assumed to be of the type M_3PO_4 and the urates of the type $M_2C_5H_2N_4O_3$. The acids found are accordingly much more than sufficient to combine with all the bases. In the mixed normal urine, however, the acid phosphates and probably the acid urates are always present so that the excess of free acid, when calculated in this way, would be much diminished. Table 3 gives the total bases and the acidity per 100 c.c. when the phosphoric acid is assumed to act in salts M_2HPO_4 and the uric acid as $MHC_5H_2N_4O_3$.

TABLE 2.—Na AND Cl EQUIVALENTS.

URINE 1.

.0900 NH_4 = .1150 Na	.7366 Cl = .7366 Cl
.1980 K = .1165 Na	.1640 SO_4 = .1213 Cl
.3820 Na = .3820 Na	.1143 PO_4 = .1281 Cl
.0104 Ca = .0119 Na	.0641($C_5H_2N_4O_3$)" = .0274 Cl
.0092 Mg = .0176 Na	1.0134
.6430	

.6430 Na = .9924 Cl.

URINE 2.

.0840 NH_4 = .1073 Na	.7160 Cl = .7160 Cl
.2455 K = .1445 Na	.1964 SO_4 = .1452 Cl
.3710 Na = .3710 Na	.1742 PO_4 = .1953 Cl
.0086 Ca = .0099 Na	.0691($C_5H_2N_4O_3$)" = .0295 Cl
.0121 Mg = .0233 Na	1.0860
.6560	

.6560 Na = 1.0126 Cl.

URINE 3.

.1080 NH_4 = .1380 Na	.7739 Cl = .7759 Cl
.2604 K = .1532 Na	.3230 SO_4 = .2389 Cl
.4647 Na = .4647 Na	.3135 PO_4 = .3514 Cl
.0132 Ca = .0152 Na	.0876($C_5H_2N_4O_3$)" = .0375 Cl
.0152 Mg = .0291 Na	1.4017
.8002	

.8002 Na = 1.2350 Cl.

URINE 4.

.0800 NH_4 = .1022 Na	.5274 Cl = .5274 Cl
.1416 K = .0833 Na	.1965 SO_4 = .1453 Cl
.3419 Na = .3419 Na	.2062 PO_4 = .2312 Cl
.0031 Ca = .0036 Na	.0549 $C_5H_2N_4O_3$)" = .0235 Cl
.0144 Mg = .0276 Na	.9274
.5586	

.5586 Na = .8622 Cl.

URINE 5.

.0745 NH_4 = .0952 Na	.8165 Cl = .8165 Cl
.4872 K = .2866 Na	.2790 SO_4 = .2063 Cl
.3578 Na = .3578 Na	.3111 PO_4 = .3487 Cl
.0164 Ca = .0188 Na	.0769($C_5H_2N_4O_3$)" = .03.9 Cl
.0225 Mg = .0431 Na	1.4044
.8015	

.8015 Na = 1.2371 Cl.

URINE 6.

.0576 NH_4 = .0736 Na	.5893 Cl = .5893 Cl
.3869 K = .2275 Na	.2039 SO_4 = .1508 Cl
.2705 Na = .2705 Na	.2230 PO_4 = .2500 Cl
.0130 Ca = .0149 Na	.0858($C_5H_2N_4O_4$)" = .0358 Cl
.0341 Mg = .0654 Na	1.0259
.6519	

.6519 Na = 1.0062 Cl.

TABLE 3.

No.	Bases as Na	Acids as Cl	Deficiency of Acid, as Cl
1	.6430	.9570	.0354
2	.6560	1.0062	.0064
3	.8002	1.2142	.0208
4	.5586	.8386	.0236
5	.8015	1.2714	(.0346)+
6	.6519	.9247	.0875

This method of calculation exhibits an excess of the basic elements in all but the fifth urine. This urine was characterized further by a very high electrical conductivity. In all cases, however, another acid is present, the importance of which is commonly overlooked. This is carbonic acid, which plays a part as essential as that of ammonium, which likewise is usually omitted from consideration. The amount of carbonic acid normally present is much more than sufficient to form bicarbonates with the excess of bases indicated above.

Table 4, calculated empirically, gives an idea of the more important combinations as formed from the elements of the above analyses. The numbers refer to grams per 100 c.c., and for convenience in comparison the phosphates are figured as neutral salts.

The figures show, fairly correctly, the relative importance of the sodium potassium and ammonium salts. In all cases the chlorin is sufficient to combine

2. THE JOURNAL A. M. A., May 30, 1903, p. 1508; Jour. Am. Chem. Soc., vol. xxiii, 1901, pp. 632-638.

with all the sodium, and, in the first, second, fifth and sixth urines, with a large part of the potassium also. In 2 cases, Nos. 5 and 6, the total weight of potassium salts is greater than the weight of sodium salts present. The ratio of the sodium to the potassium is shown by the following table:

TABLE 4.

	1	2	3	4	5	6
NaCl	.9716	.9436	1.1819	.8696	.9100	.6880
KCl	.3089	.3013	.1191	.....	.5554	.3610
K_2SO_4	.0804	.1951	.4411	.3154	.4363	.3704
$(NH_4)_2SO_4$	.1646	.1222	.1098	.0312	.0527	.....
K_3PO_4	.....	.....	.....	.....	.....	.0565
$(NH_4)_3PO_4$	.1244	.1399	.2155	.1973	.1653	.1591
$Ca_3(PO_4)_2$	.0269	.0222	.0341	.0080	.0423	.0336
$Mg_3(PO_4)_2$	.0255	.0440	.0553	.0524	.0818	.1062
Mg, excess	.0022	.....	.....	.....	.....	.0055
PO_4, excess	.....	.0395	.1152	.0375	.1204	.....

TABLE 5.

	1		3	4	5	6
Na / K	1.92 9	1.511	1.784	2.414	0.734	0.700

In the three ordinary urines, the ratio is nearly uniform, with the sodium in considerable excess. In the vegetarian urines, Nos. 5 and 6, the ratios are close, with the potassium in excess. In No. 4, however, which is also a vegetarian urine, the ratio is peculiarly abnormal, the sodium being in very great excess. In consulting the table from which these ratios are taken, it will be seen that this urine is low in basic bodies throughout; the sodium is not high here, but the potassium is unusually deficient. In this urine the sodium and the chlorin are present in practically exact equivalents.

It will be interesting also to compare the excretions of urea and uric acid in these six urines. The relation is shown in Table 6.

TABLE 6.

	1	2	3	4	5	6
Urea / Uric acid.	43.8	37.2	33.6	38.3	37.9	32.9

The average ratio for the ordinary urine is 38.3 to 1, and for the vegetarian urine 36.4 to 1. The difference is not great enough to be considered as in any sense characteristic. It has been claimed that in the urine of vegetarians a relatively greater portion of the nitrogen is excreted as urea and less as uric acid, but these figures do not bear out the assumption.

The vegetarian urines all contain creatinin, although somewhat less than the others. This result confirms some data which I have previously reported,[3] and is important in proving beyond question that creatinin is a product of metabolism and not, as stated by many physiologists, a produce derived from the creatin of muscular food. The diet in the cases considered contained no creatin.

Finally, attention must be directed to the relatively high combining value of the ammonium present. In one case, it is more than equivalent to the potassium, while in two other cases it is but little below. The amount for the vegetarian urines is slightly lower than for the others, but in previous investigations the reverse has been the case. In this respect, therefore, as in others, there seems to be no characteristic difference between the two kinds of urine.

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3. Jour. Am. Chem. Soc., xii, p. 592.

Special Article

IMMUNITY.

CHAPTER X.

THE PHENOMENON OF AGGLUTINATION.

Agglutination, in the bacteriologic sense, refers to the clumping and sedimentation of micro-organisms from a homogeneous suspension by the action of a serum. This is the so-called Gruber-Widal reaction.

A number of investigators had already seen that serums would often cause the clumping of bacteria, but Gruber and Durham first saw the significance of the phenomenon. They saw that only certain serums would agglutinate a particular bacterium, that the reaction was a specific one, and that the serum which would cause the strongest agglutination of a micro-organism was that of an animal which had been made immune to it by repeated injections.

Specificity.

Widal's service consisted in the utilization of the phenomenon as an aid in the diagnosis of typhoid fever. He is the originator of clinical serum diagnosis. It is perhaps largely a matter of accident that we speak of the Widal reaction rather than the Grünbaum reaction; Grünbaum was carrying on the same work at the same time, but Widal preceded him in the publication of his more extensive work.

Widal and Grunbaum.

In the chapter on natural immunity it was stated that normal serums sometimes were able to agglutinate bacteria. Normal human serum may agglutinate the typhoid, colon, pyocyaneus, and dysentery bacilli, and occasionally the staphylococcus and cholera vibrio; it does not agglutinate the streptococcus and some other organisms. In certain cases it may agglutinate the typhoid bacillus even when the serum is diluted to one in thirty, a point of practical importance in the clinical use of the test. When a normal serum is found to have a high agglutinating power, a previous infection by the micro-organism is to be thought of. This possibility receives emphasis from the fact that the serum of a new-born child is devoid of many of the agglutinins which are found in later life. Hence, of the so-called normal agglutinins, many, after all, may be acquired properties.

Normal Agglutinins.

The term immune agglutinin is applied to the agglutinating substance of a serum, when the property has developed as a result of infection, or of systematic immunization with the organism. They are formed during infections with the organisms of typhoid, cholera, dysentery, plague, etc.

Immune Agglutinins.

When produced artificially, the bacteria may be injected into the veins, subcutaneous tissue, and peritoneal cavity; in some cases they may be fed to animals, rubbed into the skin, or sprayed into the lungs. If certain micro-organisms are sealed up in a collodion sac and placed in the abdominal cavity of an animal, an agglutinating serum will be formed; the necessary substances diffuse through the sac and reach those body cells which produce the agglutinin. It is not necessary that living bacteria be injected; in fact, the strongest agglutinin is said to be formed by the injection of bacteria which have been killed by a temperature of 62 C. In certain instances, disintegration products and precipitates obtained from bacteria are efficient.

Nearly all bacteria, even when non-pathogenic, will give rise to an agglutinating serum when injected; but not all have the power equally. Nicolle and Trenell distinguish three groups of bacteria in regard to their agglutinability by their homologous serums.[1] The first group includes easily agglutinable organisms, for the most pathogenic: Typhoid, dysentery, cholera, plague, glanders, and the

Agglutinin Producing Organisms.

1. The homologous organism for a typhoid serum, for example, is the typhoid bacillus, and vice versa; other organisms, or other serums, are heterologous. These are commonly used terms.

colon, psittacosis, pyocyaneus bacilli, and the *B. enteritidis*. They yield agglutinating serums readily either as a result of infection or by immunization. The second group comprises organisms which, during infection or convalescence, do not produce agglutinins, but they may be forced to do so by the systematic immunization of animals. In the third group are included those which, even during prolonged immunization, rarely cause the formation of an agglutinating serum: the Friedlander bacillus. These facts may be taken as an index of the diseases in which we expect to obtain the agglutination of a bacterium by the serum of the patient.

Variations in Agglutinogenic Power of Organisms.

The degree of agglutinating power which may be obtained by immunization varies greatly. Van der Velde speaks of a typhoid serum which in a dilution of one in one million was agglutinating, and Durham had a cholera serum which was effective in a dilution of one in two million. Such powerful serums are rarely obtained.

Even two different strains of the same organism may be very unequal in their ability to cause the formation of agglutinins. It is generally said that the typhoid bacillus, which is itself agglutinated with difficulty, gives rise to a weak agglutinating serum, while an easily agglutinable strain gives a strong agglutinin. The logic of this will become apparent when we consider the nature of the bacterial substance which stimulates to the formation of agglutinin.

Variations in Agglutinin.

That the agglutinating power of the serum of a typhoid patient varies from day to day is a fact of practical importance. It may be thirty times as strong one day as the next, and may even disappear entirely for a day or two. Hence the importance of making more than one test in a suspicious case, when the first trial has been doubtful or negative. There is no adequate explanation for this great variation. It is said that mixed infections, intestinal hemorrhage, or a sudden pouring out of typhoid bacilli into the circulation may cause a sudden reduction in the agglutinating power. This occurrence has an important bearing on the possibility of using the agglutinating power of the serum as a prognostic sign; although it has often been noted that in fatal infections agglutinins may be absent from the serum, the variations just mentioned indicate that prognosis could not be based safely on the result of a single agglutination test.

Distribution of Agglutinins in Body.

The agglutinating substance is found in the highest concentration in the blood serum, but it may be demonstrated in the various body fluids and in the extracts of organs; it is said to be particularly rich in the milk. It is present in the serum of an artificially produced blister, and it has been recommended that blistering be resorted to in order to obtain the serum for the test. The bile often agglutinates the typhoid bacillus, but the power has no necessary relationship to a pre-existing infection: it is possible that the agglutination in this case is due to obscure chemical causes rather than to the usual serum agglutinin. The administration of pilocarpin causes a rise in the agglutinating power of the tears, sputum and some other body fluids; the drug increases cell secretions.

Inheritance.

When a pregnant woman has typhoid fever, agglutinins have been found in the serum of the fetus. In some cases, it has been held that agglutinin may pass from the mother to the fetus, in others, that the presence of agglutinins arose from infection of the fetus itself.

Although the milk may be very rich in agglutinin, it is doubtful if the serum of a breast-fed child undergoes much increase in its agglutinating power because of the ingestion of the milk. The gastric and intestinal juices digest the agglutinin.

The origin of agglutinin in the animal body is not known. Inasmuch as the blood serum has the power to the greatest degree, it may be formed and excreted by the leucocytes; but this is not satisfactorily established.

Agglutination and Immunity.

One of the most interesting and important phenomena in the study of immunity is the so-called Pfeiffer reaction. An animal which has been made immune to cholera by repeated injections of the cholera organism, has the power of digesting or dissolving the cholera vibrio when the latter are placed in the fresh serum or in the peritoneal cavity of the immunized animal. Gruber and Durham were studying this phenomenon in the test tube when they first observed the agglutination reaction. It was found that the agglutinating property, as well as the bactericidal power, was the result of immunization. Inasmuch as the bactericidal power was associated with the immunity of the animal, the question naturally arose: Does this associated property, the agglutinating power, go hand in hand with the bactericidal power as an evidence of immunity?

Many observations have been made which show that the two are entirely distinct, and that they depend on different substances in the serum. The following are the important points involved:

1. The bactericidal power is destroyed at 56 C., while the agglutinating power resists a temperature of 62 C.

2. In certain cases it has been possible to cause the bacteria to absorb the agglutinin from the serum, leaving the bactericidal substance intact.

3. A serum may be bactericidal but not agglutinating.

4. During the course of natural or experimental typhoid fever or cholera the development of the agglutinating and bactericidal powers may not be parallel. In cholera, the agglutinating power may disappear soon, but the bactericidal power remains for a long time.

5. Micro-organisms which have been killed by a bactericidal serum may lose their virulence, agglutinated bacteria do not.

6. There is as yet no convincing evidence that bacteria are agglutinated in the body of an immune animal, the fluids of which apparently are able to kill the organism.

Besredka found an apparent relationship between agglutination and immunity; if typhoid bacilli were agglutinated before they were injected into the abdomen of a guinea-pig the animal would recover, but if they were not agglutinated death resulted. The explanation which others have offered for this loss if virulence is that the bacilli being agglutinated and immobilized are more readily taken up by the phagocytes; if phagocytosis is inhibited by some means the agglutinated organisms are found to be still virulent.

Koch has attempted to use the agglutination test with the tubercle bacillus as an index of the immunity of the individual against tuberculosis. This is not accepted as a reliable test for the immunity, but is perhaps a general index of the ability of the individual to form antibodies for this organism. This method was devised inasmuch as the bactericidal test with the serum and bacillus gave no positive information; the serum does not kill the tubercle bacillus.

Technic of the Agglutination Test.

One may use two methods of determining the agglutination of bacteria: 1. The macroscopic or naked eye observation of the clumping and sedimentation of a homogeneous suspension of the bacteria in test-tubes; 2, the microscopic observation of the clumping of the organisms when the latter are mixed with serum and mounted as a "hanging-drop" preparation.[2]

The Bacterial Suspension.

When the organism to be tested grows rapidly, it is the custom to use a young culture, one which has grown on an agar surface or in bouillon for from eighteen to twenty-four hours. Older cultures of the typhoid bacillus or of the cholera vibrio are agglutinated with more difficulty than a young culture. If the agar culture is used, the bacteria may

2. For a hanging-drop preparation it is necessary to have a slide with a saucer-shaped depression on one surface. A drop of the solution to be examined is mounted on a cover-glass, and the latter is then mounted, drop side down, over the depression and the edges of the cover-glass sealed with vaselin or paraffin. There is ample room for motile organisms to swim about in such a preparation, and the loss of motility incident to agglutination is readily observed.

be washed from the surface by pouring into the tube five or ten cubic centimeters of physiologic salt solution and shaking vigorously; the resulting suspension is then ready for use. For either the macroscopic or microscopic test it is absolutely essential to have a homogeneous suspension of the bacteria, in order to avoid misinterpretations which may be occasioned by the accidental or natural clumping of some of the organisms; the tubes should be shaken thoroughly before the emulsions are used. This uniformity of suspension is readily accomplished with such organisms as the typhoid bacillus and cholera vibrio, motile organisms; but when they grow in chains (streptococcus) or in coherent masses (diphtheria and tubercle bacilli) more violent measures must be resorted to. Daily shaking of a liquid culture of the diphtheria or tubercle bacillus is fairly effective, but the medium must be passed through a paper filter before it can be used safely; in this way the larger clumps are removed. Some investigators dry a large quantity of tubercle bacilli, grind them up thoroughly in an agate mortar and suspend the particles in salt solution; the fragmented condition of the organisms does not interfere with their participation in the agglutination reaction. One should have a uniform technic in preparing a bacterial emulsion in order to obtain as nearly as possible the same number of bacteria in a given volume of solution, on different occasions. For example, one may uniformly suspend a twenty-four-hour agar culture in ten cubic centimeters of salt solution. There is a certain quantitative relationship between the mass of bacteria to be agglutinated and the agglutinating power of the serum.

To Obtain Serum.

To obtain serum for the test one may resort to blistering; place a cantharides plaster from one-half to three-fourths of an inch square on the abdominal skin, protect it with a dressing, and in about twelve hours remove the serum with a sterilized hypodermic syringe. Or, one may collect in a small test tube .5 to 1 c.c. of blood from the lobe of the ear or finger-tip, and draw off the serum after it has separated by clotting. It is the custom in some well-equipped laboratories to fill several U-shaped capillary tubes with blood from the lobe of the ear and to separate the blood from the serum at once by centrifugation. The custom of drying a few drops of blood on a coverglass or on filter paper, and of sending this preparation to a laboratory for the agglutination reaction, has been practiced quite extensively, and is a justifiable procedure when it is not possible to collect the pure serum. It has the disadvantage that the experimenter never knows exactly how much blood has been collected, and consequently can not perform the test with exact dilutions of the serum, the importance of which will be pointed out below. The red corpuscles and débris in such a preparation also interfere with the clearness of the field in microscopic examination, a difficulty which may be partly overcome by filtering the dissolved serum.

Serum Dilutions.

When only a small amount of serum is available, it is necessary to use the microscopic method. Normal human serum, when concentrated, and even when diluted to one in ten or higher, sometimes agglutinates the typhoid bacillus and some other organisms; the same serum, when diluted to one in forty or one in sixty, may not agglutinate. The serum of a typhoid patient, however, or of a typhoid convalescent rarely fails to agglutinate in these higher dilutions. It is generally held that a dilution of one in forty or fifty is sufficiently high to eliminate the possibility of agglutination by a normal serum, and sufficiently low to render the serums of all, or nearly all, typhoid patients agglutinating. The necessity for dilution of the serum is emphasized by the additional fact that infections with related organisms, as the colon bacillus, cause a slight increase in the agglutinating power for the typhoid bacillus along with a relatively large increase of colon agglutinins. A test with a low dilution of this colon serum might give a positive reaction with the typhoid bacillus and might lead to an incorrect interpretation; but if a dilution of one in forty were used, the non-agglutination of the typhoid bacillus would speak against a typhoid infection. This will be considered later under "group agglutination."

The "Loop" Measurement.

A convenient method of measuring small amounts of culture and serum is by means of a fine platinum wire which is bent at its tip to form an eyelet or "loop."[3] If one places one loop of serum into a small watch glass or hollow-ground slide, and adds nine loops of bouillon or of salt solution, a dilution of one in ten is reached. Five loops of this mixture with five of the diluent gives a dilution of one in twenty. One loop of the second dilution, to which is added one of the culture suspension, gives the desired dilution of one in forty. The last may be mixed directly on the cover-glass, and then inverted on a hollow-ground slide. It is readily seen how with even a minute quantity of serum, and at the same time, one may make the test with dilutions of one in ten, one in twenty, one in thirty, one in forty, etc., details which are necessary for a correctly performed test. It is important that in the different dilutions the same amount of bacterial emulsion be used.

In the macroscopic test, more serum is necessary, though the quantity need not be large, and the dilutions are made in test tubes of suitable size. One should always deal with definite quantities of the serum dilutions, and should always add the same amount of bacterial emulsion in the various tubes involved in a given test.

The Microscopic Reaction.

If agglutination occurs in the microscopic preparation described above, one sees, with the high power, in the course of from fifteen minutes to a half-hour, that two or more micro-organisms which come in contact have a tendency to remain in this position. In the case of a motile organism (typhoid) the movements may be exaggerated for a time. In the course of the next few hours, other cells are added to incipient groups and new groups originate. Motility becomes less and less and eventually ceases, in a characteristic reaction. The maximum change has taken place in from six to eight hours. Not less than four or five cells which are permanently agglutinated are considered indicative of a positive reaction; the test is most decisive when large masses are formed, so large that they are seen readily with a low magnification. A similar preparation to which no serum has been added should always be made, in order to eliminate spontaneous or "auto-agglutination" as a possible source of error.

The Macroscopic Reaction.

In the macroscopic reaction, the homogeneous cloudiness of the mixture of serum and emulsion becomes changed by the formation of smaller and larger flakes or clumps of bacteria, which in the course of a few hours sink to the bottom as a white precipitate leaving a clear overlying fluid. Here also a control tube, to which no serum has been added, should be preserved for comparison.

The body temperature, which may be obtained in a thermostat, facilitates the reaction.

The Agglutinin Unit.

The value of an agglutinating serum can not be expressed in units with the same exactness that is attained with diphtheria antitoxin. The limits of the reaction are not sufficiently definite; a given mass of bacteria has the power of absorbing varying amounts of the agglutinating substance, and it is impossible to obtain standard bacterial emulsions.

One may arbitrarily decide on a unit similar to that of Züpnik, in which a given volume of a serum dilution of one in forty, which is able to agglutinate a given mass of bacteria, is taken as the standard. If a similar amount of the serum in a dilution of 1 in 120 caused the agglutination of the same amount of bacteria, the serum would be called one of three-fold strength, etc.

The value of the agglutination reaction as a clinical diagnostic aid will be considered later in connection with the individual diseases.

A consideration of agglutination would be incomplete if one

3. Pfeiffer introduced a conventional "loop" of such dimensions that it held 2 milligrams of bacterial cells as taken from a solid surface, like that of agar.

did not mention the phenomenon as it occurs with cells other than those of bacteria, in particular the red blood cells. The serums of many animals, as stated in a previous chapter, are toxic for the erythrocytes of some other species. In some instances, the corpuscles lose their hemoglobin under the influence of the serum; in other instances, or even with the same serums, the corpuscles are thrown into clumps and settle to the bottom of the test-tube, leaving a clear overlying fluid. The phenomenon, of course, may be followed under the microscope. The analogy with the bacterial agglutinins goes still further, in view of the fact that the formation of these "hemagglutinins" may be induced artificially in the body of an animal by the injection of erythrocytes from another species. An animal does not form agglutinins for its own cells (auto-agglutinins), and rarely, if ever, for the cells of another member of the same species (iso-agglutinins). What is said in the next chapter concerning the specificity of the bacterial agglutinins also holds for the hemagglutinins.

Agglutination of Red Blood Corpuscles.

There are some plant toxins, true toxins with a haptophorous and toxophorous structure, which agglutinate red blood cells: ricin, abrin, crotin, etc. Some of the earliest and most important work which Ehrlich has done in the field of immunity was accomplished with these plant toxins.

Plant Hemagglutinins.

(To be continued.)

New Instrument

INSTRUMENT FOR STRETCHING THE INTESTINE TO FACILITATE INTESTINAL ANASTOMOSIS.

FRANK S. HOUGH, M.D.

SIBLEY, IOWA.

These instruments were devised for the purpose of facilitating intestinal anastomosis (Fig. 1). I do not claim that they will fill every requirement or that they will be used to replace the elaborate methods now in use by our most skillful operators, but I have no doubt that they will be found useful by many a modest surgeon who is called on to do this kind of work, sometimes on short notice, and with the lack of skilled assistants.

The instrument (Fig. 1, No. 1) with serrated edges is for "end-to-end" work. The plates, when the instrument is closed, are directly opposite each other and the serrated edges do not become apparent until the instrument is opened by the sliding of one plate on the other (Fig. 2, No. 1). Each lateral half of the closed plates is introduced into the open end of the bowel to its fullest extent and then, the thumb being in the thumb ring and the index and middle fingers being in the finger rings, the instrument is opened to any desired extent by pulling the finger rings down toward the thumb ring and the bowel is put on the stretch. The thumbscrew then maintains this position. This stretching must not be beyond the physiologic limit, and when this has taken place the free edge of each portion of bowel is accurately adjusted and is brought in close apposition to the edge of its mate. Although the interrupted Lembert (deep), or the mattress suture seems most applicable, the continuous suture is just as easily applied. In either case three interrupted sutures can be applied very advantageously, one on the distal (from the handle) point, and one behind and one in front, each at about the middle point between the distal and proximal ends of the plates. These three sutures securely anchor the bowel in position and the contiguous margins can be sutured rapidly by one of several methods. The sutures can be tied or made taut in the continuous suture, to at least three-quarters of the entire circumference, and such is the stretching capacity of the bowel that this instrument, after being closed, can be taken out with but three or four sutures not tied. The grip of the thumbscrew is loosened by a turn to the left, the blades are closed, and the untied end of bowel nearest the handle is slid outward off the end of that margin of the closed plates, and finally the end of the plates is easily liberated. As soon as one corner is out the whole instrument comes away with perfect ease. The ease of delivery is augmented by the fact that the serrated edges are made to disappear by the closure of the instrument. The distance from the handle to the lateral margin is no greater than the width of the closed plates. It is an advantage to have these plates enter the bowel as far as possible, and, so long as the distance from handle to lateral edge does not ex-

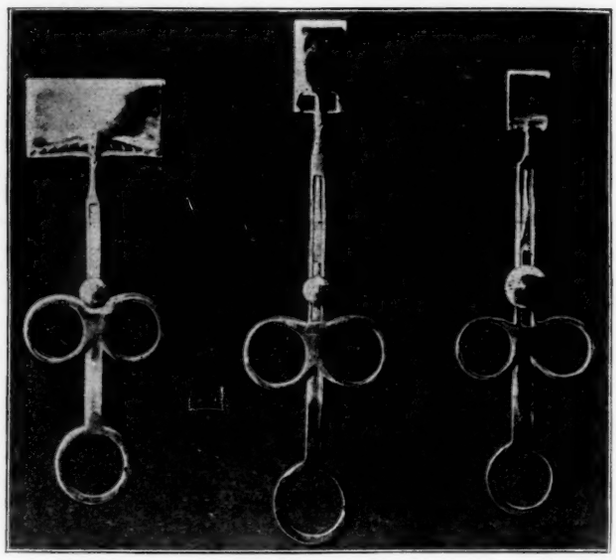

Figure 1.

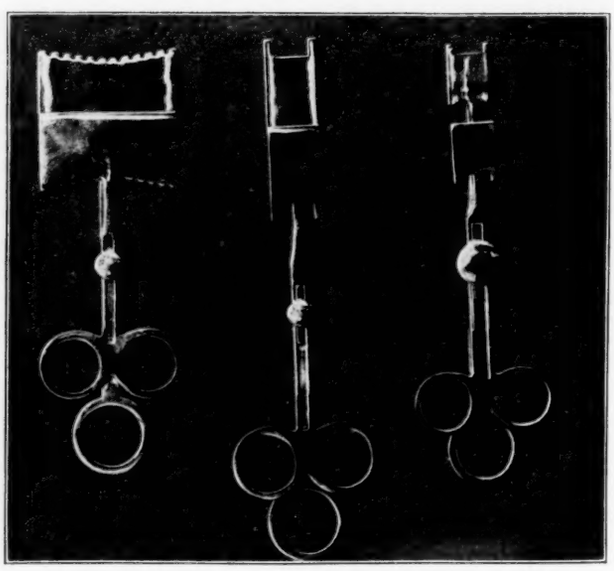

Figure 2.

ceed the width of the closed plates, no interference with delivery is found. After the delivery of the instrument, the few already inserted sutures, at former site of handle, are tightened and tied and the anastomosis is then completed.

After applying the three interrupted sutures to hold the contiguous edges of the bowel and to prevent them from slipping apart, the continuous suture can be started at no great distance from the handle, either in front or behind, and continued around to a point opposite, leaving room for the delivery, when a one-looped knot can be made to keep the suture taut to this point. Then the continuous suture can be continued around the handle to the point of starting, but so

loosely that the closed plates can be readily extracted, and then the continuous suture can be tightened and tied (Fig. 3).

Another way is to apply interrupted sutures at infrequent intervals, so that six or eight at equidistant points would extend around the entire circumference; all but two near the handle are tied. Then a continuous Lembert suture is inserted slightly over or beyond this line, and either knotted as before or made loose near the handle, so that the closed plates may be extracted and the two interrupted and the continuous sutures tied in succession. This instrument permits the sutures to be applied with great accuracy, and when the bowel afterward contracts the sutures are closer together than they appeared to be when they were applied. In the case of the continuous

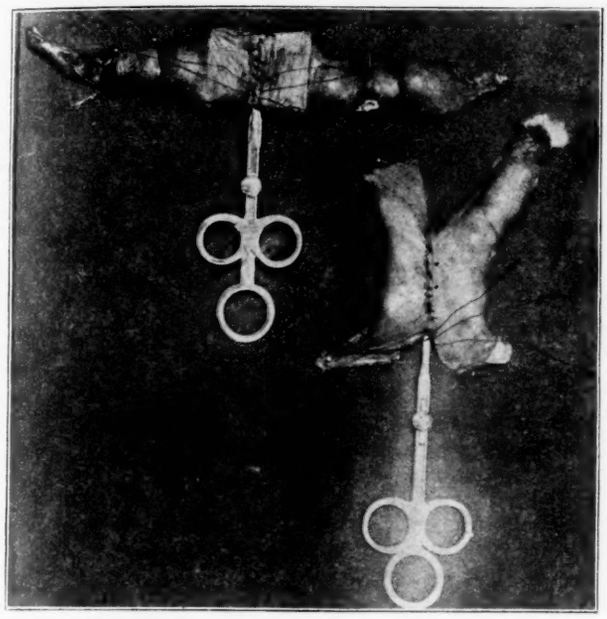

Figure 3.

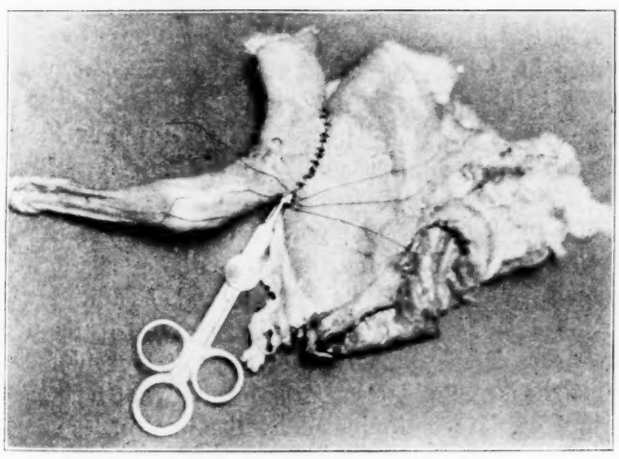

Figure 4.

suture, while the tension is lessened, the physiologic contraction does not make interspaces for leakage, because tissues during this contraction are bulked up more than enough to make up for this, and the healing is enhanced by the absence of pressure necrosis caused by tight suturing. In using this instrument it is not necessary to overstretch the bowel and no possible harm will come from its judicious use. Its action as a splint is fully performed well within the physiologic limit of stretching.

Instrument No. 2 (Fig. 1, No. 2) is for lateral anastomosis and is on the same principle, except that the incised lines are put on the stretch instead of the lumen of the bowel, and very little stretching is here required, as the processes at the corners, when the instrument is open, are well within the bowel and the bowel can not slip off the plates unless the bowel should tear. When this instrument is closed the processes at the corners are covered and there are only straight edges. When the instrument is fully opened the plates still overlap a little, offering no chance for leakage and giving the bowel edge a firm support at every point (Fig. 2, No. 2).

Two incisions of equal length and longer than the length of the closed plates are made, and each lateral half of the closed plates is inserted into a corresponding opening in the bowel and the instrument is opened. The further working of the instrument, the method of application of the suture and delivery of the instrument has already been described.

Instrument No. 3 (Fig. 1, No. 3) is for gastroenterostomy. It is smaller and more easily delivered, and when it is fully opened (which may not be necessary) it allows of some separation of the adjacent margins of the blades. This gives a somewhat wider range of latitude in length of the incisions, without making the plates longer (Fig. 2, No. 3). There is the possibility of a little leakage at the place where the plates are apart, but this separation is only one-fourth of an inch (if the full extent of separation is used), and practically there will be no leakage. In this instrument very little room is required for delivery of the closed plates—not more than that taken up by two or three untied sutures (Fig. 4).

When these instruments are in operation there is complete hemostasis and the prevention of leakage. Their mechanism is extremely simple and the technic of their use is mastered without trouble.

New Appliance

A FRAME FOR EXAMINING EYE SKIAGRAMS.

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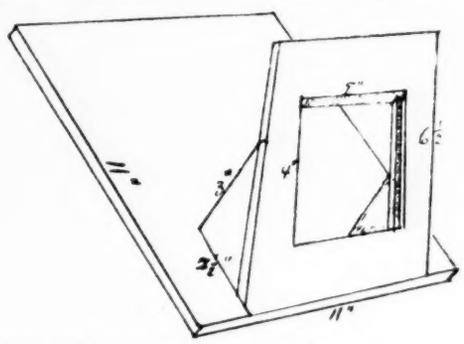
As I am frequently called on to make eye examinations and to localize foreign bodies in the eyeball, I found it necessary to devise some convenient method of holding the negatives made after the Sweet method, which would leave both hands free for using the instruments, and for making measurements, and which at the same time would give a good illumination; so I made the frame which is here illustrated. It is made of three-eighth inch poplar and is varnished to prevent warping.



The plate holder is set at an angle of about 45 degrees with the base, and the opening in it, of just the size to take a 4x5 negative, is rabbeted at the sides to prevent the plate from falling through.

The base is 11 inches square, and the plate holder is 6½ by 7½ inches.

When in use, a sheet of white paper, smooth but not glossy, is laid on the base to reflect light up through the negative; either light from a window or from an artificial source may be used. It is better to use paper than to paint the base white, as a painted surface is too apt to give a glare.

In making measurements I use calipers or compasses and a right-angled triangle made of celluloid.

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THE ELIMINATION OF INFECTIOUS MICROBES FROM THE DISEASED BODY.

Accurate knowledge of the ways in which the causative agents of infectious diseases are discharged from the infected body is of great practical value. The same means that carry pathogenic microbes into the outside world are also most important means of spreading infection. Hence the physician must know the modes of elimination in order to apply such measures as most quickly and certainly help to render patients with communicable diseases or their agents harmless to others. When we look at this elimination of pathogenic microbes a little more closely we find that there are at least two distinctly different forms of elimination: 1. Immediate elimination from the morbid focus by way of pathologic products; and 2, indirect elimination by means of the circulating blood through normal secretions and excretions.

In the case of immediate or direct elimination it is necessary that the seat of disease should communicate directly with the outside of the body. This is the case with all the diseases associated with surface inflammation or infection of mucous membranes as an essential manifestation. Here belong the infectious forms of conjunctivitis that cause many of our immigrants trouble; infections of the nasal mucous membranes, such as lepra, glanders, diphtheria; of the tonsils and pharynx, such as diphtheria, streptococcal and other forms of angina; of the laryngeal and bronchial (pulmonary) membranes, such as tuberculosis, pneumonia, influenza and whooping cough; of the intestinal tract, such as typhoid fever, dysentery and cholera; of the genitourinary passages, such as gonorrhea and tuberculosis. Here belong also local and general infections associated with lesions in the skin; of general diseases of this group we have smallpox, measles and scarlet fever. This enumeration by no means exhausts the list of diseases that are most favorably situated with respect to self-propagation; observe here the majority of the important infectious diseases.

Unquestionably, sterilization of the mucous membranes (especially of the respiratory and oropharyngeal), and of the materials which they convey, is one of the greatest problems in connection with the prevention of infectious diseases. Disinfection of the discharges from the urinary and intestinal tracts is a simple matter compared to the disinfection of the sputum, visible and invisible, by practical and generally applicable methods in all those conditions in which it may contain infectious agents.

A word should be said, too, of the danger of autoinfection, local as well as general, in the process of elimination of pathogenic bacteria, especially from remotely situated localities. This phase of the subject is illustrated especially well by tuberculosis.

In the second form of microbic elimination, two conditions have to be met: the microbes must reach the general circulation and they must pass the epithelial barriers presented by glandular organs and mucous membranes. Now, infectious bacteria frequently reach the circulating blood, often, no doubt, in an accidental and more or less passive manner, but also as the result of inherent, invasive powers, illustrated in the bacillemia of typhoid fever and pest, in the pneumococcemia of pneumonia, and in the active bacteriemia in virulent, so-called septic infections.

What fate is in store for bacteria that enter the blood? In the first place, they may be destroyed by the bacteriolytic and phagocytic power of the blood; if but few in number they may be deposited like inorganic particles in the pulp of the spleen or in the bone marrow and gradually destroyed; and they may be eliminated in the urine and otherwise. It appears to be generally accepted that some form of lesion is necessary in the kidney in order that bacteria may pass from the blood to the urine. These lesions may be caused by the bacteria subsequently discharged in the urine. Be that as it may, no one questions the occurrence of bacterial elimination by way of the kidneys, and, as frequently emphasized in recent years, typhoid bacilli are so eliminated in at least 25 per cent. of the cases of typhoid fever, judging from the typhoid bacteriuria which thus becomes established. The dangers of spreading infection by this form of bacillary elimination are self-evident, and must be prevented by measures that are familiar to all intelligent physicians.

Bacteria are also eliminated from the circulation by way of the bile, and typhoid and tubercle bacilli, as well as other germs, are said to be demonstrable in the bile in a considerable proportion of cases of typhoid fever, general tuberculosis, etc. Experimentally, at least, certain bacteria are eliminated by the intestinal mucous membrane. As regards the elimination of bacteria from the blood by the glands of the skin, the investigations have given contradictory results.[1] Tubercle bacilli frequently appear in the milk of cows with but limited tuberculous lesions not necessarily located in the udder. Tubercle bacilli have been demonstrated in the milk in a woman with advanced phthisis. Finally, mention may be made of the fact that the unknown causative agent of rabies is eliminated freely in the secretions of the salivary glands, a fact that well explains the infectiousness of the bites of rabid animals.

1. See Gotschlich, Handbuch der path. Mikroorganismen, I, p. 163.

On the basis of this survey, it is urged on physicians that in all acute infectious diseases thorough disinfection of the urine, the feces, the sputum and the nasal discharges is fully indicated because any or all of these may contain infectious germs capable of carrying infection to other persons. We believe that this rule should be carried out more generally and more consistently than has been done heretofore.

LECITHIN—ITS POSSIBLE ROLE IN RADIOTHERAPY.

Lecithin is a substance of importance not only to the physiologic chemist but also to the pathologist and to the biologist. The more it is studied the more remarkable are the properties it manifests; and this is of additional interest in view of the fact that, from a chemical point of view at least, it is a comparatively simple body, being a combination of four substances, phosphoric acid, glycerin, a fatty acid and a base, cholin, all simple compounds whose chemical formulæ are well known. It is found in probably every cell in the animal body and undoubtedly plays a most important rôle in the metabolism of the cell, forming with albumins a combination known as lecithoproteids, from which it may easily be split off. It also furnishes the phosphorus in the synthesis of the important class of proteids known as the nucleins.

As a remarkable property of lecithin may be mentioned the very important fact pointed out by Kyes that this substance may act as a complement in hemolysis produced by cobra venom, thus playing a rôle analogous to that of a ferment. Again, Detre and Sellei[1] have shown that the hemolytic effect of corrosive sublimate is very materially reduced in the presence of lecithin. This is due to the formation of a harmless compound by the union of the sublimate and the lecithin. The poisonous action of the sublimate on cells, partly at least, may be explained in this manner. The lecithin of the cells enters into combination with the poison, thus preventing the building up of the nucleins which obtain their phosphorus from the lecithin group.

Another important contribution to the study of lecithin made recently by Werner[2] seems to indicate that it is to play an important part in radio-chemistry as applied to medicine. In studying the effect of radium on tissues, Werner, obtaining the suggestion from the works of Schwartz[3] and also of Schaper, who, from their study of eggs, showed that radium acts chiefly on lecithin, injected into the skin of animals a suspension in water of lecithin which had been exposed to radium rays for two or three days. Such lecithin he calls activated and with this he was able to produce exactly the same changes in tissues as is produced by the radium rays alone. The inactivated lecithin was without effect. He finds also that lecithin may be activated in the same way by the x-rays, this result being confirmed later by Exner. Treatment of the lecithin by heat (60°-70° C.), sodium chlorid, potassium hydrate, mineral acids, pepsin hydrochlorid and diffuse light failed to activate it. Of what this so-called activation consists has not yet been determined. It does not appear to be due to the splitting products resulting from the decomposition of lecithin, for activation and decomposition do not run parallel, and again, injections of the well-known splitting products of lecithin do not have the specific effect. The possibility of the replacement of x-ray and radium exposures by the local injection of activated lecithin is considered by Werner in a favorable light, but as yet no practical application has been made.

The question here involved is of great importance from a therapeutic standpoint, as it concerns the treatment of deep-seated malignant growths, inaccessible at present to the application of curative rays. It is to be hoped that some means may be devised whereby a selective action may be obtained on such growths. We have, therefore, a line of work suggested here which appears to be as promising as another line of work which also seeks for a selective action on tumor tissue, but in a very different manner, namely, serum therapy.

1. Wiener klin. Wochft., 1904, No. 49.
2. Centlb. f. Chir., No. 43, 1904, also Deut. med. Wochft., No. 2, 1905, and THE JOURNAL, page 666.
3. Pflüger's Archiv, 1903.

PROVIDE ANOTHER OUTLET.

For some years the profession has felt strongly that there are too many medical schools and too many ill equipped physicians. We all know that many schools are very "lame." We speak of them freely among ourselves, but few of us mention them in print for fear of hurting the feelings of some of our friends. The task of dealing with the problem has been left to the Council on Medical Education of the American Medical Association.

In the meantime we are all seeking remedies for this ill condition that is so detrimental to the welfare of the profession. Ohio suggested a remedy when it took the great step forward of passing a state law providing a minimum educational requirement for entrance to medical schools and gave its enforcement into the hands of the impartial public school system. New York has long had a similar regulation controlling entrance to medical colleges. Kentucky, on July 1, 1905, enters the same company. This method is excellent, in that it excludes the unfit at the beginning. The work, then, is well begun, and other states must soon fall in line or suffer the uncomfortable consequences.

But why have we too many medical schools? Can we not also tackle the problem simultaneously from the top? And, lastly, can we not provide some recompense to those who must lose teaching positions as schools are closed? The first question is not difficult to answer. As we enter the profession all of us desire fame and reputation, as well as full pocket-books. Fame comes slowly to him who confines himself to private practice. A hospital appointment and a professorship constitute alluring and promising shortcuts. Secondly, can we

find a means to attain reputation that will attract us away from the professorships; and thirdly, that will furnish continued opportunity to those crowded out of places by the diminution in the number of schools? It is believed that these two questions can be answered in the affirmative.

In a large part of the United States the existing profession is sorely in need of postgraduate instruction to enable it to fulfill its whole duty to itself and to the community. One of the aims of our perfected organization was the facilitating of postgraduate study and instruction. Why not, then, arrange to combine these mutually satisfying needs? Let the schools and teachers soon to be without students set themselves to the splendid task of improving the attainments of the vast number of physicians who necessarily must live far from clinics and laboratories. Why not provide for systematic and semi-compulsory postgraduate training of the members of our organization? Having thus combined these two needs it will be found that fame is to be attained in teaching physicians just as formerly in instructing undergraduates. He who wants to teach will have just as good a chance as he ever had. The number of members in an overcrowded profession will be steadily reduced. The educational qualifications of the present generation of physicians will be materially improved. The only drawbacks lie in the friction incident to the initiation of the process. If the state medical associations take hold of the matter in proper spirit, the difficulties will soon fade. The proposal is far from being chimerical, and it is confidently believed that the next few years will somewhere witness a trial of this method of disposing of the most vexed problem that demands solution at the hands of the organized profession.

THE CEREBROSPINAL MENINGITIS EPIDEMIC.

Dr. Councilman's paper in this issue is a timely one on account of the present epidemic aggravation of cerebrospinal meningitis in portions of the Atlantic seaboard states. The principal features of the disease were editorially noticed in THE JOURNAL March 18, but Councilman's paper brings out more prominently certain specially significant points bearing on the present epidemic. It is evident that it is not exactly of recent origin; on the contrary, there has been a notable frequency of the disease and a heightened mortality from this cause in New York and southern New England for a year or more past. The present mortality, however, of 70 or 80 a week in New York City, as reported in the press dispatches, is a formidable one and indicates a very serious prevalence or virulence of the infection. The opportunity is specially favorable for investigating certain questions relating to the disorder and, considering the evident seriousness of the situation, such an investigation as has been begun is imperative.

Councilman shows that the meningococcus, like the pneumococcus, is always with us and that the reason for its apparently increased virulence at certain times is, as in the case of the other, still a problem for the pathologists. The mortality in different epidemics varies very greatly and therefore is not by any means a true index of the actual prevalence of the infection. It is even possible that there may be a certain degree of morbidity due to the meningococcus that is not recognized as such, and that, as in the case of scarlet fever, there may be cases in which the after consequences are the most noticeable symptoms. This may be the case during the prevalence of an epidemic and a retrospective diagnosis based on them and on the general prevalence of the disease be the only one possible. Almost universally, however, the cerebrospinal system is affected and the other possibility is offered simply as a suggestion. The facts that the great majority of the sporadic cases of primary meningitis are due to Weichselbaum's diplococcus and that it has been found in the nasal secretions of normal individuals indicate the necessity of more general bacteriologic diagnosis in all suspicious cases. Cerebrospinal meningitis is a very serious matter when it occurs as an epidemic and though the danger of direct infection has been considered slight, recent developments have somewhat altered this opinion.

We trust that the New York health authorities and the pathologic research institutions will leave no stone unturned to settle the questions of the cause of the apparently aggravated virulence of the germ at the present time and its relations to the general morbidity from the infection in whatever form it may be manifested. There should be also a careful study of sporadic cases in other parts of the country where the disorder does not exist in an epidemic form and, as Councilman suggests, even climatic conditions should not be neglected. How an organism of such low vitality as that producing cerebrospinal meningitis can exist between epidemics without giving more abundant pathologic evidence of its existence is a matter worthy of investigation.

ISTHMIAN SANITATION—THE COMMISSION'S REJOINDER.

Shortly after the publication of Dr. Reed's report on "Isthmian Sanitation," March 11, we wrote to the Isthmian Canal Commission, tendering the columns of THE JOURNAL for the publication of their reply, which, consequently, appears in this issue. A copy of the reply in proof was forwarded to Dr. Reed with a proffer of such space as he might desire for a rejoinder. To this tender we have received the following reply:

"CINCINNATI, March 28, 1905.

"Accept my thanks for your tender of THE JOURNAL for a rejoinder to the commission's reply to my report. It seems to me, however, that the commission has made so many specific admissions fatal to its own contention and confirmatory of my charges, and by labored explanation has so endeavored to obscure the real issue

in other particulars, that there is but little left to say. I shall, however, put that little into the form of a supplementary communication to the Secretary of War, to whom, of course, must be left the matter of its subsequent publication.

"In this same connection I wish to state that I have profound respect for the discipline and for the proprieties of the various departments of the government. I consequently recognize that, *from this viewpoint alone*, the publication of my report at my instance was a mistake. It was, however, a mistake based on a misunderstanding, for which I alone was responsible and for which I apologize to the Secretary of War and for which, furthermore, I herewith apologize to the medical profession.

"With cordial appreciation and approval of your policy, by which the commission is given as free and open a hearing as was accorded to me, and with the hope that the medical profession will accord a careful reading to the commission's reply, I am, very sincerely,

"CHAS. A. L. REED."

Whatever may be the character of Dr. Reed's rejoinder and whether it is ever submitted for publication or not, the medical profession has now been furnished with material on which to form a reasonable and accurate judgment of the situation at the isthmus, for which thanks are due to Dr. Reed. So far as his report, already published, is concerned, every one recognized that it embraced a series of facts and incidents that were recounted to support one important if not vital charge, namely, that the sanitary department at the isthmus is unduly subordinated to other departments of the isthmian government. Many of the incidents are intrinsically trivial and it is possible that Dr. Reed may have been misled in some minor matters—as any one, however careful, might easily have been misled—by the statements of others on whom, naturally, he had to rely for information. Whether or not Dr. Reed was thus misled will probably appear from his rejoinder, based, no doubt, on documentary evidence, some of which he sent with his report to this office, but which, for want of space, was not used at the time.

The one general charge, the important one of improper subordination of the sanitary department, remains, however, to be considered. This, too, is denied by the commission. But, unfortunately for the commission, it fails to disprove the existence of the law which it enacted by which this subordination is effected and, still more unfortunately for the commission, it gives, as will be seen from its report, a dozen or more instances in which it did overrule the recommendations of the sanitary department, thus demonstrating the truthfulness and justice of Reed's contention.

If the rest of the denials are no more conclusive than this one, Dr. Reed may rest for his vindication, if any were needed, on the document that we publish to-day. But, fortunately, Dr. Reed requires no vindication. He has worked too long, too zealously and too disinterestedly for medical science and for the medical profession, and his report now under criticism was too distinctly prompted by interest in the public welfare for him to be discredited by the unsupported denial of a commission that is struggling to avoid summary dismissal.

TRUTH AND POETRY CONCERNING URIC ACID.

XII.

The suggestion of Wollaston[1] that in some way or another uric acid is definitely related to the pathology of gout followed, as we have seen, his demonstration of the uratic nature of gouty deposits. It received unexpectedly great support about the middle of the last century through certain observations of Garrod,[2] which led that physician to conclude that the blood of gouty patients contains an abnormally large amount of uric acid.

Garrod introduced what is known as the "thread test" for uric acid in the blood. To a little blood collected in a watchglass is added some dilute acetic acid; a linen thread is immersed in the mixture and the whole allowed to stand for twenty-four hours, evaporation being prevented. If the uric acid in the blood is increased, crystals of uric acid separate out, according to Garrod, adhere to the thread and can be recognized under the microscope. The results of the application of this thread test led Garrod to the belief that the quantity of uric acid in the blood is always increased in gout, not only during the attacks, but before them and in the intervals between attacks. Indeed, his findings indicated that the increase is greatest shortly before an attack, and he ventured the opinion that this increase is directly responsible for the attack.

These remarkable observations of Garrod naturally excited great interest and a large number of control observations began to be made by various clinicians. Prominent among those who have confirmed Garrod's findings, almost in their entirety, may be mentioned Bence-Jones, Ranke, Charcot and more recently Sir Dyce Duckworth. The results of other investigators have been confirmatory of Garrod's work only in part; thus Salomon found an increase of uric acid in the blood in the acute attacks only, not before or after them, while Cantani supported Garrod as far as chronic gout is concerned, but agreed with Salomon as to the findings in acute gout.

A strong opponent of Garrod's view appeared in Emil Pfeiffer,[3] who urged that a positive finding with Garrod's test does not necessarily indicate an increase of uric acid in the blood, but rather that the blood at the time contains its uric acid in some form which dissolves with difficulty; in other words, that the substance exists in the blood as some "easily separable" modification. We know now from the chemical and physical studies

1. Wollaston: Gouty and Urinary Concretions. Phil. Tr., Lond., vol. ii, 1797, p. 386.
2. Garrod, A. F.: Researches on Gout. Medicochir. Tr., vol. xxv, 1848, p. 83; vol. xxxvii, 1854, p. 49.
3. Pfeiffer, E.: Natur und Behandlung der Gicht. Verhandl. des viii Kongr. f. inn. Med., 1889, 166.

of uric acid which have since been made that Pfeiffer's objection is not valid, for when uric acid separates out of solution this is almost always due not to alterations in the chemical nature of the uric acid but to alterations in the conditions of solubility of the substance.

Obviously, to make Garrod's findings more conclusive, it was desirable that they should be controlled by exact quantitative estimations of the uric acid in the blood. Garrod and Salomon both attempted this, but unfortunately made their determinations with the inaccurate method of Heintz. Studies with more exact methods were made by Klemperer and later by Strauss, but the best research of all in this particular field is that of Magnus-Levy,[4] published in 1899. The latter made accurate determinations of the uric acid in the blood in no less than 17 cases by gravimetric analysis, using the reliable Ludwig-Salkowski method. His research has taught us that the uric acid of the blood is always increased in gout; there is, however, no constant increase just before an attack in contrast with the amount present in the free intervals such as Garrod thought he could demonstrate.

The most superficial and unreliable work recorded on the amount of uric acid in the blood in gout is, perhaps, that of Haig. Using a method which rests on a pure assumption and which has no well-founded chemical basis, he has drawn, as Luff and others have shown, wholly unwarrantable conclusions. It is a pity that so faulty a worker should have presented his views in so convincing a manner as to make their acceptance, by those who are unable to refute his premises, a foregone conclusion.

If we have good ground, and we think we have, for believing that the uric acid of the blood is increased in amount in gout, the question naturally arises, is such an increase pathognomonic for gout or is it met with also in other conditions? The pathognomonicity of the symptom must be denied, for an increase of uric acid in the blood is found in nephritis (Garrod[5]), in diseases in which the red blood corpuscles are injured (v. Jaksch), and, temporarily, in health after nuclein-feeding (Weintraud). These facts have led many to think that perhaps after all the increase of the uric acid in the blood may not stand in any very definite relation to the main symptoms of gout. Some even go so far as to hold that the increase is to be regarded as merely accidental, a view recently supported with some vigor by Zagari.[6] Others, among them Cantani and von Noorden, suggest that the increase of uric acid in the blood is not the cause of gout, but is due rather to the partial solution and absorption into the blood of the gouty deposits. Still, right or wrong, the prevalent belief, we think, is that an increase of uric acid in the blood in gout is, in the main, responsible for the clinical symptoms. Those who hold to this view, however, admit that the increase alone does not suffice to explain gout, and they conceive of certain alterations in the blood or tissues, or of external injuries, as accessory etiologic factors.

In any case, we stand before the fact that the uric acid of the blood is increased in gout, and it must therefore be important to search for the cause of such increase. One might think *a priori* of an increased uric-acid formation, of diminished uric-acid excretion, of lessened destruction in the body of uric acid once formed, or, finally, of a combination of these different factors. An epitomizing of the actual work which has been done in this connection will be our next task.

4. Magnus-Levy, A.: Ueber Gicht; klinische Beobachtungen, chemische Blutuntersuchungen, und Stoffwechselversuche. Zeits. f. klin. Med., vol. xxxvi, 1899, p. 353.

5. Confirmed by Kam and v. Jaksch.

6. Zagari, G.: Il bilancio organico di un gottoso durante e fuori l'accesso. Napoli, 1898; also Zagari, G. e D. Pace, La genesi dell' acido urico e la gotta. Napoli, 1897.

AN APPEAL TO NEW YORK.

In our news columns is an item in regard to the osteopathic bill in the New York legislature. It is evident that unless the profession wakes up New York will be afflicted with this ridiculous measure. Without a shadow of doubt, the influence of the physicians of New York state is far greater than is that of the osteopaths, but the osteopaths are active and are working day and night and are bringing to bear all the influence they can control to carry their measure. The committees representing the New York State Medical Association and the Medical Society of the State of New York are doing what they can, but, as we intimated two weeks ago, they are not backed by a united profession. Now is the time for the individual physician to do his part by either writing or telegraphing his representative at Albany, protesting against the passage of the osteopathic bill. If one in ten of the physicians in New York State will do this, and will take the trouble to bring their influence to bear on their representatives in this matter, the bill will be defeated.

MALPRACTICE INSURANCE AND MEDICAL DEFENSE.

It appears, according to a recent opinion of the attorney general of Iowa, that physicians can not take out insurance in that state against malpractice suits. The Travelers' Insurance Company of Hartford is issuing such policies, assuming liability for fixed sums of money which may be included in the costs and damages in case of such litigation. It applied for admission in Iowa but was refused, as far as this form of policy is concerned. The theory on which the opinion is based seems to be that it is contrary to public policy to allow a physician to be relieved from any of the consequences of possible mistake in treatment of a patient. Considering the fact that probably nine-tenths of all malpractice suits are pure blackmail, instigated by quacks and foraging lawyers, the finding seems to be a peculiar one. If justice were done in all cases few of these suits would come to anything, but the fact is that juries are specially fallible in this particular regard and are apt to take altogether too little account of the many important factors that may mar the success of any kind of medical or surgical treatment. Hence some of the

cases of gross injustice which are familiar to all of us. The remedy for the state of affairs left as a result of this opinion given out in Iowa will be in the better organization and co-operation of the reputable members of the profession. The attorney general can hardly use the same arguments against medical defense provisions in the state and local medical societies.

THE DANGERS OF SELF-DRUGGING.

Mr. Edward Bok's latest installment of his campaign against the abuse of patent medicines is in the April *Ladies' Home Journal*. He brings out three chief points. The first is to emphasize that the manufacture of hypochondriacs is a regular business—an intentional process—carried on by the diabolical advertisements of the patent medicine man. The repeated and insistent suggestion that a certain slight ache or pain is the symptom of something serious makes the reader dwell on his imaginable ailment until he buys a bottle of the remedy. In the second place Mr. Bok explains how some testimonials are obtained for patent medicines. In the case cited the testimonials were wholly lies, the authors not having used the medicine. The third point which Mr. Bok makes is that even if the medicine possessed merit, and even if the testimonials were genuine, it would not justify the use of the medicine without the physician's advice, because the patient is not competent to make a diagnosis on the similarity of symptoms, which may be very deceptive. Mr. Bok is very clear and straightforward; at the same time he is on safe and conservative ground. His article for this month is remarkably free from doubtful or objectionable statements and is, altogether, a strong and convincing plea for the exercise of ordinary good judgment before succumbing to the almost universal passion for self-medication that is developed and fostered by the flaring and suggestive advertisements in the daily papers. Much of what Mr. Bok has to say will apply to the proprietary secret remedies; substitute these for his "patent medicines" and unthinking physicians for unthinking laity, and it will not be far wrong. Mr. Bok is to be congratulated on his courage in persisting in his fight in spite of the opposition of certain newspapers, whose editors evidently are fearful that in proportion as his propaganda is successful will one of their great sources of income be cut down.

MANUEL GARCIA AND THE LARYNGOSCOPE.

On March 17, the London Laryngological Society celebrated the one hundredth birthday of Manual Garcia, a well-known Spanish singing teacher in London, and also the fiftieth birthday of the laryngoscope. Garcia, though not a physician, became the founder of a new and important specialty in medicine by his discovery of the laryngoscope. In March, 1855, he published in the Proceedings of the Royal Society[1] his "Observations on the Human Voice," based, to a large extent, on the introduction into his own throat of a mirror, which he illuminated with direct sunlight at the same time as he observed the movements of his own vocal cords in a second mirror. This was the foundation of modern laryngology. Two years later the celebrated Tuerck of Vienna was studying diseases of the larynx by means of the laryngoscope, studies that culminated in his great work on laryngoscopic pathology and therapy. In the meantime the younger Czermak was doing pioneer work for laryngology in Leipzig, and in 1859 he announced the demonstration of posterior rhinoscopy. Thus were diseases of the nose and throat made accessible to direct inspection, diagnosis and treatment. The discovery of cocain, in 1884, greatly promoted the development of the new specialty which was founded as the result of a singing master's intelligent interest in voice production. No wonder that the rare anniversary on March 17 brought Garcia the congratulations and gratitude of physicians the world over.

1. Vol. vii, p. 399.

SOME RECENT LEGISLATION.

Some of the enactments of recent legislatures show evidence of good work on the part of the legislators. Oregon, in which state members of the association are particularly interested because of the approaching session to be held at Portland, seems to be progressive. It has passed an indeterminate sentence law, has authorized probation of persons not previously convicted of felony, and has authorized the establishment of a juvenile court in districts of 100,000 or more inhabitants. This law, further, forbids the commitment to jail of children under 12 years of age and provides for a board of visitors to visit institutions and associations which receive children under the provisions of this act. A woman's reformatory has been authorized by the New Jersey senate. The California legislature passed an act repealing the compulsory vaccination law, but the watchful governor vetoed it, and the legislature came to its senses and rejected the proposal to pass the bill over the veto, by a vote of 23 to 3. The message of the governor, who, by the way, is a physician, is a cogent, readable brief on the subject of vaccination. North Carolina, in its recent legislative session, took advanced ground on the questions of child labor, divorce and vagrancy. The *Outlook* states that "the most liberal provisions ever adopted were made by the North Carolina legislature for the care of the insane and other unfortunates . . . and for the public schools." While these matters are sociologic and only indirectly related to medicine, yet physicians, more than any other class, are interested in them and in the progress being made.

Medical News

ALABAMA.

Accident.—Dr. Jesse E. Robins, city physician of Ensley, was seriously injured in a runaway accident, March 4.

Fire Losses.—Dr. Lucian A. Spencer, Bessemer, suffered a loss of $10,000 in the destruction of his house by fire. He carried only $2,500 insurance.——The offices of Drs. Byron T. and Orion T. Dozier, Birmingham, were destroyed by fire. The loss was $7,500; the insurance, $1,000.

Personal.—Dr. William C. Wheeler, Huntsville, has been reelected physician of the city and of Madison County.——Dr. Robert B. Harkness, Birmingham, has been elected city physi-

cian and physician of Jefferson County.——Dr. E. P. Lacey, Bessemer, has been critically ill with pneumonia.

CALIFORNIA.

Hospital Opened.—The Sisters' Hospital, Chico, was opened to the public March 1.

Hospital Incorporated.—The St. Francis Hospital Association has been incorporated at San Francisco with a capital stock of $75,000.

February Deaths.—During February 1,178 deaths were reported, equivalent to an annual mortality of 15.68 per 1,000. Tuberculosis caused 210 deaths; heart diseases, 141; pneumonia, 119; cancer, 47, and cerebrospinal meningitis, 19.

Personal.—Dr. John Gallwey and wife, San Francisco, started for Europe, March 16.——Dr. Ferdinand Stabel, Redding, has been made physician and health officer of Shasta County.——Dr. Claeburne W. Evans, Modesto, has been re-elected physician of Stanislaus County.

Los Angeles Illegal Practitioners Sentenced.—Mrs. S. J. Bridge, "cancer specialist," pleaded guilty and was fined $100.——"Dr." William S. Lair has been found guilty of fraud.——Ira Guilford, "magnetic healer," was fined $100, March 10.——Henry Nanzita, "Oriental doctor," was fined $350, March 11, and paid his fine.——"Dr." C. C. Hewitt pleaded guilty and was fined $100.

COLORADO.

Personal.—Dr. J. Ernest Meiere, Cripple Creek, who has been seriously ill with pneumonia and erysipelas at the Sisters' Hospital, is now convalescent.

February Mortality.—During February 881 deaths were reported in the state, equivalent to an annual mortality of 19.97 per 1,000. Fourteen deaths were reported from typhoid fever, 6 from diphtheria, 5 from scarlet fever, and smallpox caused one death.

Contagious Diseases.—During February there were reported to the State Board of Health 133 cases of scarlet fever, 73 cases of smallpox, 62 cases of diphtheria and 21 cases of typhoid fever. Compared with the previous month, February shows an increase of 56 cases of scarlet fever and 12 cases of smallpox, and a decrease of 55 cases of typhoid fever and 25 cases of diphtheria.

Defective Vision and Hearing of School Children.—Results of a recent investigation conducted under the direction of the State Board of Health show that 15.66 per cent. of the 14,403 school children examined have defective vision, and that 2.7 per cent. have defective hearing. Of the defective vision subjects, 6 per cent. wore glasses, 8 children were totally blind in one eye, and 1 was nearly blind in both eyes.

DISTRICT OF COLUMBIA.

Quarantine Station Accepted.—The district commissioners have accepted the new smallpox quarantine station near the jail. The building is a two-story frame structure and contains 40 rooms.

License Revoked.—Dr. Sigmund A. Czarra, charged by the board of medical supervisors with unprofessional conduct and with circulating improper literature, was found guilty and his license was revoked. This is the second time the board has had Dr. Czarra before it. Its findings in the first instance were reversed by the Court of Appeals.

Navy Medical School Commencement.—The annual graduation exercises of the Navy Medical School were held in the National Museum March 25. A class of 23 was graduated and President Roosevelt delivered the principal address and presented the diplomas. Addresses were also made by Dr. William H. Welch, Baltimore, and Medical Director R. A. Marmion, U. S. Navy, president of the faculty.

Would Drop Word "Insane."—In the annual report of the Government Hospital for the Insane the superintendent suggests that the name "Government Hospital for the Insane" have the objectionable word "Insane" left off, and that the institution be called merely the "Government Hospital." During the year 3,135 patients were under treatment; 643 were discharged and 243 died. Of the patients under treatment from the services 1,111, or about 82.53 per cent., were from the Army.

FLORIDA.

Insane Hospital Changes.—Dr. Robert L. Goodbred, Mayo, has been appointed managing physician of the Florida Hospital for the Insane, Chattahoochee, vice Dr. V. H. Gwinn, resigned.——Dr. James H. Randolph, Tallahassee, has been appointed assistant physician, vice Dr. Eldred C. Christian, resigned.

Personal.—Dr. James L. Niblack, Lake City, has been appointed a member of the board of medical examiners for the Third district, vice Dr. Joseph A. Townsend, Lake City, deceased.——Dr. Washington Kilmer, Orlando, has been appointed registrar for Orange County.——Dr. Joseph N. Fogarty, Key West, has been made a member of the board of medical examiners in and for the Third Judicial district.——Dr. Stephen M. Gonzalez, Pensacola, has been made special physician for Escambia County, and Dr. Daniel W. McMillan, Pensacola, has been re-elected physician of the same county.——Dr. James G. Baskin, Dunnellon, has been selected as state senator to succeed Hon. C. M. Brown.

GEORGIA.

Personal.—Dr. William Bradford, Cedartown, has been appointed private secretary to Congressman Gordon Lee.

Throat Cut in "Difficulty."—In a dispute over the ethics of keeping in the little girl of Dr. W. D. Williams, Cataula, after school hours, the husband of the teacher drew his knife and cut the physician's throat. The injury was serious, but Dr. Williams is expected to recover.

Malpractice Suit Fails.—In the suit of John M. Casey, Stillmore, against Drs. Leonidas P. Lane of that place, and G. L. Smith, Swainsboro, in which he claimed $20,000 damage for the alleged negligence, incompetence and lack of skill of these physicians in treating compound comminuted fracture of both legs, the jury found for the defendants.

ILLINOIS.

Personal.—Dr. William H. Fitch, Rockford, has been appointed surgeon of the new I., I. and M. Railway.

Watch Factory Hospital.—The Elgin watch factory has installed an emergency hospital with two wards and an operating room, on the second floor of its new main building.

Munificent Bequest to Hospital.—By the will of Abram Brokaw, who died a few days ago in Bloomington, $100,000 in cash, farms valued at $50,000, and released debts amounting to $15,000, are bequeathed to the Brokaw Hospital.

Progress of Senate Bills.—The optometry bill (Senate 237), reported defunct, seems to have taken a new lease of life, for it passed the senate March 16. The practice of optometry is defined to be the employment of any means other than the use of drugs for the measurement of the power of vision and the adaptation of lenses for the aid thereof. The provisions of the act shall not apply to physicians duly licensed to practice medicine under the laws of this state, nor to persons who sell spectacles or eyeglasses on prescription from any duly qualified optometrist or physician, nor to dealers in spectacles and eyeglasses, who neither practice nor profess to practice optometry. In accordance with the decision of the Supreme Court of Illinois in the case of People vs. Charles L. Smith (208 Ill. 31), opinion filed Feb. 17, 1904, a person who measures the powers of vision and adapts lenses is not practicing medicine as defined by the Illinois statutes. This bill is still in the judiciary committee of the house. There will be no hearing on this bill until the second week in April, if then. The bill is being opposed by a committee appointed by the Council of the Chicago Medical Society, acting in conjunction with the secretary of the State Board of Health.——The same forces are opposing the osteopathic bills (Senate 169 and 392. See THE JOURNAL, March 18). It is believed that these bills will not pass. A new bill (Senate 311) creating a state board of osteopathic examiners and providing for the issuance of osteopathic physicians' certificates which permit the practice of osteopathy, obstetrics and surgery, has been introduced in the senate and referred to the committee on judiciary.——The consumptive sanitarium bill (House 330) is still in the hands of the appropriation committee. The prospects for its passage with a reduced appropriation are good.——Senate bill 158, placing physicians in Cook County service under civil service, has passed the senate, as has Senate 271 for the regulation of scientific experiments on human beings and animals.——House bill 182, providing for the treatment of persons afflicted with rabies, under the direction of the State Board of Health, has passed the house.——The epileptic colony bill is dead.——The registered nurses' bill (Senate 225) has passed the senate.——House bill No. 577, which gives to the State Board of Health

sanitary supervision over lodging-houses in cities of 100,000 inhabitants or more, is in the judiciary committee of the house of representatives.

Chicago.

Fined for Illegal Practice.—"Dr." Frederick L. Orsinger on March 24 was fined $200 for practicing medicine without a license. The prosecution was undertaken by the State Board of Health.

Davis Tablet Unveiled.—The memorial tablet for the late Dr. N. S. Davis was unveiled in Davis Hall of the Northwestern University Medical School, March 24. Addresses were made by Drs. George W. Webster, E. Wyllys Andrews, Emilius C. Dudley, W. O. Krohn and Dean Holgate of the university.

Deaths of the Week.—During the week ended March 25, 581 deaths were reported, equivalent to an annual mortality of 15.21 per 1,000. Pneumonia still leads death causes with 106; other principal causes are, consumption, 81; heart disease and nephritis, each 37; violence, 32, and cancer and nervous diseases, each 27.

Personal.—Dr. Roswell Park, Buffalo, was the guest of honor at a dinner March 25, when he described the researches for the cure of cancer which are being carried on under his direction. ——Dr. Horace M. Starkey announces that owing to ill health he will retire from practice in Chicago June 1, and will resume at Rockford October 1.

Smallpox Rampant.—During the past week 22 patients were sent to the Isolation Hospital. Of these none had been revaccinated, and 17 had never been vaccinated. Since January 1 232 cases have been discovered, and 34 patients have died, a mortality of 14.6 per cent. Four cases were discovered March 26 at a "Holiness" home, and one infant in a gypsy camp died from the disease.

Antitoxin and Diphtheria Mortality.—Ten years ago the antitoxin treatment of diphtheria was begun by the department. During the previous ten years ended Dec. 31, 1894, there had been 13,566 deaths from diphtheria reported—a yearly average of 1,356 and a proportion of 13.53 deaths to 10,000. During the ten years ended Dec. 31, 1904, there were only 8,129 such deaths reported—a yearly average of 812 and a proportion of 4.88 to 10,000.

INDIANA.

Isolation Hospital Burns.—The Allen County Isolation Hospital, Fort Wayne, was burned March 8, entailing a loss of $1,500. The two patients were removed without casualty.

Sanatorium Reopened.—In honor of the reopening of the Mary Jane Gilbert Memorial Sanatorium, Evansville, after it had been closed several months to be remodeled, receptions to the profession and the people were held March 8 and 9 by Drs. Wiliam H. Gilbert and George F. Greenleaf.

Injured and Operated.—Dr. William H. Mills, Boonville, was seriously injured in a runaway accident.——Dr. William H. Myers, Fort Wayne, was operated on for strangulated hernia, March 11.——Dr. Thompson R. Brady, Wabash, was seriously injured when his horse became frightened and backed off a bridge into the bed of a creek, south of town.

Epileptic Village Act Signed.—The governor has signed the Purviance bill providing for an epileptic village in Indiana and, the measure having an emergency clause, is now a law. Within ninety days the governor will appoint a board of three commissioners to select a location for the village. The bill carries an apropriation of $150,000. Persons entitled to admission may be committed to the village by the circuit judges of the various counties after each applicant has been passed on and recommended by two medical examiners appointed by the judge. The expense of clothing the patient and the traveling and incidental expenses are to be paid by the county, if not by the relatives of the patient, in the same manner as is now provided for the commitment of insane persons.

February Morbidity and Mortality.—The most prevalent malady was influenza. The order of disease prevalence was as follows: Influenza, pneumonia, tonsillitis, bronchitis, rheumatism, scarlet fever, pleuritis, typhoid fever, erysipelas, diarrhea, intermittent fever, diphtheria, inflammation of the bowels, smallpox, whooping cough, measles, puerperal fever, typhomalarial fever, cholera morbus, dysentery, cerebrospinal meningitis, cholera infantum. There were 381 cases of smallpox reported from 35 counties, with 8 deaths. In the preceding month there were 238 cases from 27 counties, with 7 deaths, and in the corresponding month of last year 408 cases from 34 counties, with 5 deaths. This shows a decrease in cases with an increase in deaths. Deaths from tuberculosis numbered 410, 29 of them being other forms than pulmonary. All but four counties in the state report deaths from this cause. The rate for the pulmonary form was 187 per 100,000. In the same month last year there were 365 deaths, a rate of 182.7. Typhoid fever was reported from 42 counties; 202 cases were reported, with 32 deaths. In the preceding month 273 cases were reported, with 50 deaths, and in the corresponding month last year 268 cases and 60 deaths. The pneumonia deaths numbered 741; in the preceding month, 558, and in the corresponding month last year, 711 deaths. Deaths by violence numbered 127, 28 suicides and 99 accidental. Of the 28 suicides 11 were females and 17 males. The methods chosen were: Hanging, 5; drowning, 1; gunshots, 12; cutting throat, 1; chloroform, 1; opium, 3, and corrosive sublimate, 5. The total number of deaths reported was 3,723, equivalent to an annual rate of 18.2 per 1,000. In the preceding month the total was 3,309, or 14.7 per 1,000, and in the corresponding month of last year, 3,477, a rate of 16.8 per 1,000. Deaths from important causes were; Consumption, 381, of these 29 being other forms than pulmonary; typhoid, 32; diphtheria, 26; scarlet fever, 11; measles, 2; whooping cough, 11; pneumonia, 73; diarrheal diseases, 13; cerebrospinal meningitis, 40; influenza, 229; puerperal fever, 7; cancer, 101; violence, 122, and smallpox, 8.

LOUISIANA.

Staff Reappointed.—On the recommendation of Dr. William Kohlmann, the entire staff of Touro Infirmary, New Orleans, was reappointed.

Tuberculosis Ward Soon Ready.—The tuberculosis ward which is being erected at the Insane Asylum of the State of Louisiana, Jackson, will be ready to receive patients early this month.

Presentation to Matas.—A body of physicians, students and friends of Dr. Rudolph Matas, New Orleans, called at his home March 19 and presented him with a silver service of 125 pieces and a loving cup, in celebration of the twenty-fifth anniversary of his graduation from Tulane University Medical Department. Dr. Stanford E. Chaille, dean of the medical school, made the presentation speech.

MARYLAND.

Hospital Report.—At Cambridge Hospital during 1904, 682 patients were treated. There were 18 deaths, 11 being from incurable diseases, 2 from accident and 2 from typhoid fever.

Personal.—Dr. Richard H. Dixon, Dorchester County, sustained a severe sprain of the right ankle by a fall.——Dr. Martin W. Goldsborough has been made pathologist and x-ray operator at Cambridge Hospital.

Care of State Insane.—The report of the lunacy commission shows that up to Dec. 1, 1904, there were 2,938 insane persons in the state, of whom 401 were colored. There were 220 in county almshouses, 290 in county asylums or hospitals, 793 in private and corporate institutions, and 1,635 in state and city hospitals. The total for the previous year was 2,896. The secretary, Dr. Preston, states that the insane have in large part been removed from the county almshouses, either to one of the state institutions or county asylums, which constitutes a great improvement. Four counties provide separate accommodations for the insane, 2 make some attempt at separation of the insane from the paupers, 8 send all insane to the large institutions and 8 always have a few patients that would be better cared for in a state institution. In comparing state and county supervision the following contrasts are given: State supervision—Entertainment, occupation, kindly care, scientific treatment. County system—No occupation or entertainments, negligent care, the women not safe from outrage, no treatment. He urges that the state should assume the care of all its dependent insane. He proposes that this be done by enlarging the accommodations at the two state asylums, Spring Grove to 600 or 800, and Springfield to 1,200 or 1,500. The buildings could be completed by 1909. He proposes that the former assume the care of acute cases, being near the city, and that the latter with its 700 acres is admirably adapted to take charge of the chronic cases, the criminal and the negro insane. The last class are not provided for as they should be. They must be separated from the whites, and it might be better to build a third asylum especially for them. They are very poorly provided for under the present system, chiefly in the county institutions.

Baltimore.

May Treat Deformed Gratis.—Dr. R. Tunstall Taylor has been granted permission by the school board to treat deformed school children free of charge.

Correction.—The bureau of information for visiting physicians is at the Baltimore University Hospital and not at the Johns Hopkins Hospital, as was erroneously announced in our last issue.

Committed in Default of Bail.—Dr. Isaac H. Gardiner was committed to jail March 19 in default of $10,000 to answer the charge of performing a criminal operation. A writ of habeas corpus was served for the purpose of having the bail reduced and Judge Stockbridge ordered that he be released when he should furnish $4,000 bail.

Personal.—Dr. Edward H. Hume, a graduate of the Johns Hopkins Medical School, 1901, now assistant surgeon attached to the United States consulate at Bombay, India, and specialist in diseases of the tropics, has been appointed head of the medical department of the new Yale College in Chungsha, China.——Dr. Harry Friedenwald has been re-elected president of the Baltimore Branch of the Alliance Israelit Universelle.——Dr. Solomon J. Ulman has left Baltimore for a year's tour of Europe and North Africa.

MISSOURI.

Reappointed to Staff.—Drs. William J. Doyle and Walter C. G. Kurschner have been reappointed to the staff of the City Hospital, St. Louis.

Smallpox.—Badger Township, Vernon County, has 25 or 30 cases.——Galena has 4 new cases.——Only 6 houses are now under quarantine in Joplin.

Shooter Acquitted.—Dr. William S. Carrion, charged with assaulting Dr. J. R. A. Crossland, with intent to kill, was found not guilty by a jury March 18. These two physicians of St. Joseph indulged in a pistol duel in a barber shop in September last and Dr. Crossland was twice wounded.

Want Emergency Chests on Trains.—A bill has been introduced providing that all railroads be required to have on each passenger train an emergency dressing and instrument chest, to contain the following articles: Five pounds absorbent cotton, five pounds assorted bandages, five pounds plaster-of-paris bandages, ten yards plain gauze, one-pound bottle of chloroform (to be replaced with new bottle every four months), one hypodermic syringe with tablets, one dressing case of instruments, one amputating case, one Esmarch tourniquet.

NEBRASKA.

Hospital Open.—Fremont Hospital was opened to receive patients last week.

Amendment Passes.—The amendment to the medical practice act which has been indorsed by the Nebraska State Medical Association was passed by the senate March 22, but has since been vetoed by the governor.

New Insane Hospital Buildings Ready.—The buildings of the Nebraska Insane Hospital, Norfolk, which were destroyed by fire several years ago, are now ready to receive patients. Dr. James M. Alden, Pierce, is the superintendent of the institution.

No Certificate; Fined.—"Dr." John M. Johnson, Avoca, claiming to be a graduate of Rush Medical College, but who had not obtained a certificate from the State Board of Health, was fined $50 and costs for practicing medicine without a license, March 20.

NEW JERSEY.

Provision for Conference of State and Local Health Officers.—The legislature has just passed a law providing for an annual conference of state and local health officers, sanitary inspectors and delegates from local boards of health "for the purpose of securing uniform and efficient methods of procedure throughout the state for the promotion of the public health and the restriction of the spread of preventable diseases." The conference is to be called at such time and place as the State Board of Health shall decide, and the expenses of the delegates to the conference are provided for.

NEW YORK.

Many Seek Position.—Twenty-five physicians have applied to the civil service commission for the position of fire surgeon formerly held by Dr. E. C. W. O'Brien, deceased.

Substitute for the Pure-Food Bill.—This bill has been introduced by Senator Tully, chairman of the senate public health committee. It defines the use of paraffin and shellac in the manufacture of candy as adulterants and defines adulterants and misbrandings.

Meningitis in Yonkers.—There have been 39 fatal cases of cerebrospinal meningitis in Yonkers since January 25. This is said to be a larger mortality than that of any other place in this part of the country. The patients are not isolated, but the houses in which the cases occur are quarantined.

Danger in Hospital Crowding.—The current issue of *Charities* calls attention to the lack of facilities for consumptive patients, largely due to the present overcrowding of hospitals. It is said that in the Kings County Hospital, in addition to the 70 consumptives in the separate building for the treatment of tuberculosis, 81 consumptives remain in the general wards, and 70 have died in these general wards during the winter months. In February there were 115 floor beds in use, of which 48 were in wards where there were 42 men with positive cases of tuberculosis and a number of suspects.

Progress of the Coroner's Bill.—The hearing on the Elsberg bill took place March 21, when Dr. E. Eliot Harris appeared for the legislative committee of the New York State Medical Association and gave reasons why this office should be abolished. He said that the reason the coroner was the butt of ridicule for the public and the press was because he was a veritable "Pooh-Bah," exercising extraordinary authority and filling many offices. There was no man to be found to-day with such power of mind and versatility of talent who as coroner can sit on the bench as judge and decide the kind of evidence that shall be submitted to the jury; who possesses judicial authority to issue warrants for the arrest of those who fail to obey his commands to appear before him; who leaves the bench to answer a summons to take an antemortem statement or to examine a body, and to decide the question of the cause of death, incorporating in his decision the latest researches in chemistry, bacteriology, toxicology and pathology. The office is an expensive relic of bygone ages and has no other reason for its existence except that it has existed over 700 years.

Osteopathy Bill Favorably Reported.—The osteopathy bill, as THE JOURNAL predicted, has been favorably reported by the committee on judiciary. Dr. E. Eliot Harris, chairman of the committee on legislation of the New York State Medical Association, asks that the members of the senate and the assembly be petitioned in the interest of individual and public health to defeat the osteopathic bill for the following reasons:

1. Osteopathy, so-called, is an agent or method used in the treatment of disease, and is included in the general practice of medicine.
2. Osteopathy should not be made a special branch of medicine, by an act of the legislature, but should come under the present state laws, which govern all the special branches as well as the general practice of medicine. Any licensed physician has now the right to practice osteopathy as a specialty.
3. The legislature should protect the public by denying the endorsement of the state to any person, as being capable of treating the diseases of the human body, unless such person can make a diagnosis of the condition of the human body, to do which requires a full knowledge of the science of medicine as taught in the medical colleges of this state, including the use of drugs and other valuable therapeutic agents.
4. If the so-called osteopathic bill becomes a law all candidates who fail to pass the regents' examinations to obtain a license to practice medicine in this state may in this state treat all diseases of the human body by holding a diploma from any regular osteopathic college in the United States, a privilege which would lower the standing of this state in the educational world.

And, finally, it would be more reasonable for the legislature to separate the special branches of criminal, corporation, and real estate law from the general practice of law and establish for each of them a special examining board, so as to make it easier for the candidates for admission to the bar who desired to practice as specialists, than it would be for the legislature to select one special therapeutic agent used in the treatment of disease and to separate it from the general practice of medicine as a panacea for all diseases at the request of those enthusiasts who now ask for a special osteopathic examining board.

New York City.

Much Meningitis.—Cerebrospinal meningitis has claimed 386 lives in Greater New York since January 1. Most of the victims were children.

New High Record.—Bellevue Hospital had the highest census in its history during the past week, when 1,075 patients were enrolled. The four new pavilions recently opened made the accommodation of this number possible.

Many Coroner's Cases.—According to statistics just compiled by Coroner's Physician Weston there were 11,660 coroner's cases in Greater New York during 1904. Of these 9,810 were received at the Bellevue morgue. There are 217 in the list of unknown dead.

Contagious Diseases.—There were reported to the sanitary bureau for the week ended March 18, 505 cases of tuberculosis, with 198 deaths; 383 cases of measles, with 9 deaths; 321 cases of diphtheria, with 34 deaths; 249 cases of scarlet fever, with 25 deaths; 149 cases of varicella; 135 cases of cerebrospinal meningitis, with 72 deaths; 31 cases of typhoid fever, with 7 deaths, and 1 fatal case of smallpox.

Confessed to Radium Cure Swindle.—Henry H. Kane and William H. Hale, who were arrested on evidence acquired by the counsel of the county medical society for having swindled a Mount Vernon carpenter out of $10,000 by means of a radium cure swindle, have been sentenced to serve four and eight months respectively in the penitentiary. The money was returned to the victim, otherwise the sentence would have been more severe.

For Hospital Funds.—A mass-meeting of the heads of hospitals and philanthropic workers was held March 23 to discuss the subject "How to Increase the Income of the Hospitals and to Stop the Leaks." It was suggested that the city should pay for charity patients about what the patients cost per capita, that the public should be taught to give generously and continuously, and that a business mechanism should be established to keep the interest of the public continually alive. A committee was appointed to study the present hospital conditions and to formulate a practical scheme for improving them.

The Meningitis Commission.—The first meeting of this body was held March 21, when maps of the city were studied with regard to the prevalence of the disease in certain localities, and the conditions peculiar to those localities were considered. They also studied the tabulated statistics of the past few years. They decided to issue cards to physicians in hospitals with blanks to be filled in with desired data. While all the questions were not decided, the commission will want to know the evidences of communicability and what is known of the biology of the bacilli producing the disease, with reference to differentiation, agglutination and pathogenesis. Under the clinical head they will inquire about the effect of drying on the bacilli and viability in spray, as bearing on isolation and infection. It is probable that the scope of the investigation will be worldwide and that information will be sought from hospitals all over the globe. The commissioners will give their services free and the entire amount given by the Board of Estimate and Apportionment will be expended for expenses incurred in compiling data. The Health Department has given diphtheria serum free to a number of the hospitals and to every person asking for it, the one stipulation being that they should receive reports of the results of its use. Dr. Biggs feared from what he had seen of the results of this treatment that there was little to hope from it. Every hospital in the city has cases of this disease at present and the mortality thus far is believed to have reached 70 per cent. One coroner's physician says that nearly a dozen cases have come under his notice within the period of a few days. The death rate is somewhat lower than for the past few weeks, and it is believed that the epidemic is on the wane.

PENNSYLVANIA.

To Relieve Congested Hospitals.—The house appropriation committee on March 22 reported favorably on bills for the immediate relief of the crowded state hosspitals for the insane. One-story fireproof buildings are to be erected within thirty days. For the Norristown State Hospital for the Insane $70,000 has been appropriated for four buildings; for the Harrisburg State Hospital for the Insane, $35,000 for two buildings, and for the Danville Hospital for the Insane, $85,000 for five buildings.

The Usual Anti-Idiocy Bill.—The legislature on March 21 passed a measure to overcome idiocy with the surgeon's knife. This is a proposition which has been presented to many former legislatures. It has always met with defeat, either in the committee or on the floor of the house, because it was deemed too radical a method. It passed both houses without meeting any very determined opposition by a vote of 125 to 28. The following is the text of the bill: "That on the first day of July after the passage of this bill it shall be compulsory for each and every institution in the state entrusted exclusively or especially with the care of idiots and imbecile children to employ on its staff at least one skilled neurologist and one skilled surgeon, of recognized ability, whose duty it shall be in conjunction with the chief physician of the institution to examine the mental and physical condition of the inmates. If in the judgment of this committee of experts and board of trustees procreation is inadvisable and there is no probability of improvement of the mental condition of the inmate, it shall be lawful for the surgeon to perform such operation for the prevention of procreation as shall be decided safest and most effective. The operation shall not be performed except in cases that have been pronounced non-improvable after one year's test treatment in the institution."

Philadelphia.

Personal.—Dr. and Mrs. Herbert Norris have sailed for Europe.——Dr. J. Leslie Davis left the city March 18 for a trip around the world.——Dr. Robert G. LeConte has been elected a representative of the board of trustees of the University of Pennsylvania.

Anthrax Patient Recovers.—The patient admitted to the Municipal Hospital some weeks ago from New Jersey, suffering from anthrax contracted while tending cattle which had died of the disease, is recovering and will be discharged from the hospital in a few days.

Medical Class Reunion.—The class which graduated in 1868 from the Medical Department of the University of Pennsylvania celebrated its thirty-seventh anniversary at Atlantic City, N. J., March 13. Dr. Wharton Sinkler presided and 17 members of the class were present.

Money to Charity.—The net proceeds of the American charity ball amounted to $8,800. This enables the managers to give $2,200 to each of the following charities: Hospital of the University of Pennsylvania (surgical wards), Jefferson Medical College Hospital, Pennsylvania Society to Protect Children from Cruelty and the Bedford Street Mission.

Health Report.—Typhoid fever is still rapidly on the increase, 306 new cases were reported during the week. This is the largest number in any one week this year. Last week there were 247 new cases reported, 178 for the previous week and 92 for the week before. The deaths from the disease also show a proportionate increase, being 19 for this week. Most of the new cases are from the northeastern section of the city, which is principally supplied with water from the Delaware River. Comparatively few cases have been reported from the district receiving filtered water, thus confirming the statement of the health authorities that impure and unboiled drinking water is responsible for the outbreak. Two more deaths from cerebrospinal meningitis were recorded for the week, and 8 new cases of the disease were also reported. The total number of deaths from all causes reached 531. This is a decrease of 58 as compared with last week, and a decrease of 58 over the corresponding period of last year. The principal causes of death were as follows: Typhoid fever, 19; diphtheria, 7; pulmonary tuberculosis, 51; cancer, 19; paralysis, 35; heart disease, 62; bronchitis, 17; pneumonia, 65; enteritis, 30; Bright's disease, 36. There were 409 cases of contagious disease reported, with 27 deaths, as compared with 356 cases and 32 deaths for the preceding week.

GENERAL.

Physician for Insane Hospital Wanted.—Examinations will be held in various cities by the United States Civil Service Commission on April 26 and 27 to secure eligibles from which to fill a vacancy in the position of physician in the Government Hospital for the Insane, Washington, D. C., and to fill similar vacancies later. Only unmarried women between the ages of 25 and 40 years, citizens of the United States, will be examined. Credit will be given for experience in insane hospitals, in general hospitals and in actual surgical practice. Other information may be had of the United States Civil Service Commission, Washington, or the secretary of the board of examiners at any of the cities where the civil service examinations are regularly held.

Reciprocity Convention.—The American Confederation of Reciprocating, Examining and Licensing Medical Boards will hold a meeting at the Hotel Claypoole, Indianapolis, April 27, at 10 a. m. Reports will be considered from the committees on advanced standing, uniformity of state board examinations, uniformity of entrance and graduation requirements, uniformity of forms and modifications necessary in reciprocal qualifications. Reports on these subjects were presented at the previous meeting, held in St. Louis, Oct. 25, 1904, reported in THE JOURNAL, November 5 and 19, pages 1407 and 1567. Members and ex-members of state medical boards, educators and others interested in interstate medical reciprocity are invited to be present and to take an informal and advisory part in the meeting.

District Medical Libraries in Canada.—The *Bulletin Médical de Québec* is urgently advocating the foundation of a small medical library in each district, where the physicians can see the current medical journals at least. The national medical bureau has been considering the matter and voted to apply its surplus to this purpose, but to date it has had no surplus at its disposal. A committee was appointed to study ways and means to encourage the medical societies in rural districts and to promote scientific work among them. The chairman of the committee in presenting his report said that a library of current periodical medical literature would do far more than anything else to promote the desired end. A carefully chosen collection of medical journals is the best possible means to enable the practitioner to follow the progress of science and apply the results of his clinical observation. The committee recommended that financial aid should be given only to district societies with a given minimum of regular meetings and regular attendance.

CANADA.

Manitoba Medical College to Build.—The present Manitoba Medical College building being no longer able to accommodate the classes, the authorities will build a new and larger college building close to the General Hospital. The building will cost about $50,000.

Hospital for Railway Men in Winnipeg.—A movement has been inaugurated in Winnipeg, Man., to establish a railroad employes' hospital for the benefit of the men engaged in railway work from Fort William to Calgary, N. W. T. The Order of Railway Conductors is the originator of the enterprise, and a convention of delegates from railway employes' associations will be held in the near future to draft a charter and to put the scheme on a workable basis.

FOREIGN.

Australia Medical Congress.—The next Australian Medical Congress is to be held in Adelaide, South Australia, in September, 1905.

Cothenius Medal Given to von Leyden.—The Halle scientific society known as the Leopoldo-Carolinische Akademie deutscher Naturforscher, has awarded the gold Cothenius medal to Prof. E. von Leyden of Berlin "for his services in the clinical-scientific domain."

Funds for Research on Experimental Syphilis.—The Vienna Academy of Sciences has given Professor Finger and Privatdocent R. Kraus about $400 each from the Treitl endowment, for their work on transmission of syphilis to monkeys and immunization against the disease.

A Medical College for Singapore.—An endeavor is being made to raise funds to establish a medical school in Singapore. If a sum of £7,000 ($35,000) is raised the government of the Straits Settlements is prepared to provide a building and to equip it for teaching purposes.

Charitable Bequests by Paris Surgeon.—The will of Professor Tillaux, who died last October in Paris, leaves $100,000 to a fund for providing old age pensions for working men. He also bequeathed about $2,000 to the medical association of the Seine district and $400 to the society of former internes of the Paris hospitals. Tillaux was a prominent surgeon, president of the Académie de Médecine at the time of his death, and author of several text-books.

Decrease in Numbers of Medical Students in Germany.—During the last ten years the number of medical students at the twenty German universities has dropped from 7,796 to 5,926, a decline of about 24 per cent. In 1830 there were 2,355 medical students at these universities, and this average was maintained until 1881, when the number rose to 4,779 and to 8,381 in 1890, the maximum ever attained. The number of medical students at Berlin in 1895 was 1,220; it is now 1,111.

Accommodations for the Lisbon Congress.—The Hamburg-American line has placed the *Hamburg* at the disposal of the German physicians and their families who wish to attend the International Medical Congress at Lisbon next year. The vessel will be moored at some convenient wharf and will serve as a hotel for the passengers during the congress. After a brief trip to Gibraltar and Madeira the vessel will return to Hamburg. The *Lancet* of February 11 states that Cook & Son have offered to charter a passenger ship for the English members of the congress, to serve as a floating hotel. The hygienic conditions of the anchorage are now being investigated before arrangements are finally concluded.

Annual Meeting of the Board of the Munich Medical Weekly.—Our esteemed contemporary, the *Münchener medicinische Wochenschrift*, is published by twelve physicians, only five of whom reside in Munich. The list includes Curschmann, Bäumler, von Leube and von Ranke. At the annual meeting in March about $3,100 were distributed among various societies for the relief of widows and orphans of physicians, and other organizations for the aid of members of the profession. About $500 were given to the "Leipziger Verband," $100 to the Pettenkofer House building fund, and $50 to the Riegel Memorial fund. The sum thus distributed annually out of the profits of the weekly has grown a little every year to the present total of 12,400 marks or about $3,100.

Measures Against Yellow Fever in Brazil.—A most energetic campaign against yellow fever has been carried on at Rio Janeiro by the authorities during the last few months. A large force of men has been employed to exterminate or to sterilize the breeding places of mosquitoes. The rain water drains are sterilized with the Clayton apparatus, which kills rats and all forms of life in the drains. The houses where cases of yellow fever occur are disinfected and the patients are protected with netting. The supreme court, however, has recently decided that this disinfection of a house can not be carried out against the express command of the householder, a trial case having been appealed, as mentioned in these columns March 25. The *Brazil Medico* and the chief of the public-health service express great consternation at this decision, which threatens to annul the prophylactic work of the authorities. They claim that the material is all ready for a conflagration, as there have been one or two deaths from imported yellow fever every fortnight during the last three months, the total mortality during the winter being about 13, but there has been no epidemic, as such strict precautions have been taken. Immigrants are arriving by thousands, trusting in the assertions by the government that yellow fever has been stamped out, and these assertions have been borne out by the facts; there is no yellow fever endemic in Rio Janeiro. They lament that it will regain its reputation of being a focus for yellow fever if this decision of the supreme court is allowed to stand.

Approaching International Congress of Surgery.—The preliminary announcement of this First International Congress of Surgery was mentioned in THE JOURNAL of Oct. 22, 1904, page 1242. The congress will convene at Brussels on Monday, September 18 and close on Saturday, September 23. Prof. T. Kocher of Berne will take the chair, and the following six questions have been appointed for discussion: "Value of the Blood Count for Surgery," with addresses by W. W. Keen, 1729 Chestnut Street, Philadelphia, ex-president of the American Medical Association; by Sonnenburg of Berlin, Depage of Brussels and de la Torre of Madrid. The second theme is "Treatment of Hypertrophied Prostate," with addresses by R. Harrison of London, T. Rovsing of Copenhagen and von Rydygier of Lemberg. The third question is "Surgical Intervention in Non-Malignant Affections of the Stomach," with addresses by Mayo Robson of London, von Eiselsberg of Vienna, Mattoli, Monprofit of Angers, Rotgans of Amsterdam and Jonnesco of Bucharest. The "Treatment of Tuberculosis of the Joints" is to be presented by Bier of Bonn, Broca of Paris, Bradford of Boston, Codivilla of Bologna and Willems of Ghent. The fifth theme is "Treatment of Peritonitis," with addresses by Lennander of Upsala, Friedrich of Leipsic, Lejars of Paris, McCosh of New York, Krogius of Helsingfors and de Isla of Madrid. The closing discussion will be on the "Diagnosis of Surgical Affections of the Kidney," to be presented by Albarran of Paris, Kümmel of Hamburg, Giordano of Venice and Lambotte of Brussels. It is announced that the discussions will be restricted to these six subjects. Dr. C. Willems, 6 Place St.-Michel, Ghent, Belgium, is the secretary general of the congress.

Antituberculosis Legislation in the Scandinavian Countries.—As long ago as 1901 Norway made compulsory the notification of cases of pulmonary and laryngeal consumption and of all deaths from tuberculosis. All tuberculous patients have to be instructed in regard to hygienic precautions by their attending physician or the public medical officer. The public authorities take charge of the disinfection of dwellings and private belongings. The authorities are also empowered to remove to a hospital any consumptive who is considered a menace to his surroundings. The laws further provide against employment of tuberculous nurses for children, and enjoin hygienic precautions in hotels, factories, workshops, cars, etc.

A somewhat similar law, but less stringent, went into effect in Sweden on Jan. 1, 1905. Denmark is on the point of adopting still more comprehensive regulations. The bills now under discussion have been favorably indorsed by the legislators of all parties and there is every prospect that they will be or have already been adopted. The bills were drawn up by a committee of three: Drs. K. Faber, C. Lorentzen and a government official. In addition to the provisions of the Norway law, schoolmasters are required to report any cases of tuberculosis that come to their knowledge among the children, and applicants for the post of school teacher must present a certificate to the effect that they are free from tuberculosis. A teacher suffering from tuberculosis in an infectious form is to be pensioned with two-thirds of the salary he has been receiving. All institutions where the tuberculous receive treatment are to be under government inspection, and the number of beds and rate of charges are under state control. Certain classes of patients are to receive assistance from the state and the government also undertakes to assist in building new sanatoria. These various measures undertaken by the government to prevent the spread of tuberculosis are set forth in a pamphlet recently published in French by H. Rordam at Copenhagen. The National Antituberculosis League was founded in 1901, and now has more than 29,000 members. It owes its inception to the author of the above pamphlet and to Dr. C. Lorentzen.

LONDON LETTER.

Proposed Union of the Medical Societies of London.

The want of centralization is a feature of the medical institutions of London—hospitals and societies. It is no doubt due to that spirit of individualism which has played such an important part in English life and which has led people to do things themselves instead of looking to the state to do them for them. But however admirable in some respects, and in spite of the great results which have been achieved by it, this individualism his certain drawbacks. The large number of independent medical societies in the metropolis is a case in point. This involves needless expense in the support of separate buildings and often of separate libraries, and also all the evils of want of co-ordination. Thus (putting aside merely local societies) there are four large societies which cover much the same ground and which deal with general medicine and surgery—the Royal Medical and Chirurgical, the Medical Society of London, the Clinical, and the Hunterian, and there are also the societies devoted to specialties. For many years the desirability of uniting all the societies into one body and bringing them under one roof has been mooted, but has never taken practical shape. At last, however, a step has been taken in this direction. At the annual general meeting of the most important of these societies, the Medical and Chirurgical, the president, Sir Douglas Powell, in his address spoke of the benefits to the profession from the union of the medical societies of London into one "Royal Society of Medicine." The proposal was supported by Sir Thomas Smith, Mr. D. H. Goodsall, Dr. Theodore Williams, Mr. Timothy Holes and Dr. W. H. Allchin. The following resolution was carried unanimously: "That the council of the society be requested with as little delay as possible to invite the leading medical societies of London to arrange for a joint meeting for the purpose of considering the advisability of amalgamating, and to take the necessary preliminary steps for that purpose." The project is certainly of great importance, for all these societies are not merely London societies, but representative of the men of eminence in the whole country.

Pharmacology

PHARMACY AND CHEMISTRY IN THEIR RELATIONS TO MEDICINE.

The business of manufacturing pharmaceutical preparations is essentially an American institution, and it is an interesting fact that the largest pharmaceutical manufacturing firms in the world are in the United States.

Prior to 1850 retail druggists usually obtained their supplies of galenical preparations from wholesale druggists or from manufacturing chemists, who had added galenicals to their limited line of chemicals. With the introduction of concentrated preparations, such as fluid extracts, and subsequently, the elixirs, syrups, and pills, pharmacists and wholesale druggists began to engage in the manufacture of these preparations, and gradually extended their business until to-day, some of these concerns are mammoth establishments, doing business on a gigantic scale, and providing for every conceivable medicinal want of the physician. Some of these establishments, in connection with their biologic departments, maintain thousands of live animals for experimental purposes. These establishments have grown up mostly since the Civil War, as at that time the government laboratories could not keep up with the demands of the U. S. Army Hospital Department, and, therefore, had to rely on outside manufacturers. The greater number of these firms had a small beginning, though a notable exception is the Tilden Co., at Mt. Lebanon, N. Y., which was founded by the brother of the unsuccessful candidate for the presidency in 1876, and in which he is said to have largely invested. The cultivation, collection and preservation of medicinal plants or drugs by the Shaker colony at Mt. Lebanon suggested the manufacture of the concentrated extracts, and it was there that fluid extracts were first produced on a large scale.

FLUID EXTRACTS.

The first fluid extract of the kind now familiar was made by William Procter, Jr., of Philadelphia, who published a process for making fluid extract of ergot in 1857. In the same year, Frederick Stearns of Detroit made an elaborate report on the elegant pharmaceuticals of French origin—the first of the present French specialties—in which fluid extracts of a half score drugs were also recommended. The fluid extracts were a distinct advance in pharmacy. They were sufficiently concentrated to permit the administration of the required amount of the drug without the employment of too much alcohol and they were of uniform drug strength, viz., 1 minim represented 1 grain of the drug. They had thus a distinct advantage over tinctures and other liquid preparations, whose variable strength, or rather lack of uniformity in drug strength, was often confusing. As fluid extracts could be made more cheaply on a large scale than in a small way, the large manufacturers were able to offer the ordinary fluid extracts at prices lower than they could be made by the average retail druggist, and having obtained a start in this way, the manufacturers soon extended their operations; first, by introducing new remedies in fluid extract form, and afterward by adding numerous lines of the so-called elegant preparations as these latter were devised by pharmaceutical art and science in response to progressive therapeutics, until the articles catalogued now number in the thousands.

THE ELIXIRS.

The term elixir had been used from the time of the alchemists to designate various preparations designed to prolong life, from elixir *ad longam vitam* and elixir paracelsi to elixir paregoric, but the adoption of this name for the preparations now so designated is of more recent origin. The first elixir of this class was the elixir cinchona made by A. B. Taylor of Philadelphia in 1859. This was followed by the elixir ammonium valerianate in which the disagreeable taste of the salt was nicely masked. The compound elixir of taraxacum was designed about this time by P. C. Candidus, a pharmacist yet practicing in Mobile, who accidentally discovered the value of the elixir in disguising the bitter taste of quinin sulphate. It was subsequently observed that the licorice contained in this elixir was the most effective agent in disguising the bitter taste of drugs, which led, therefore, to the use of the various elixirs of glycyrrhiza as adjuvants.

THE "PHARMACIE ELEGANS."

About this time, prominent pharmacists in Philadelphia and in New York began to put up the usual forms of prescription mixtures of quinin, iron and strychnin, the iodids, bromids, etc., in elegant appearing and palatable forms, and to sample physicians with them under the name of elixirs. The business grew until these retail pharmacies soon engaged in the manufacture of elixirs as a specialty and they became large establishments. John Wyeth & Brother, and Hubbell & Co., Philadelphia, Caswell & Hazard, and Reed & Carnrick of New York, were among the earliest of these firms to begin the manufac-

ture of these preparations. The elixirs were exceedingly palatable, they were agreeable in appearance and flavor, and when honestly and carefully prepared they were indeed a desideratum, enabling prescribers to escape the thralldom of only too often repulsive decoctions and infusions. As long as they were prepared true to formula they were a distinct advance in pharmacology and in therapeutics, but competition, and the preparation of elixirs by persons without special skill or experience caused physicians to become suspicious of this class of preparations. This suspicion was strengthened by the attempt to present every imaginable medicinal combination in the form of elixirs. The most incompatible substances were presented often in the most eligible appearing elixir, until it was said of them that they were the most striking illustration of that kind of pharmaceutical products in which "therapeutic efficiency had been sacrificed for pharmaceutical elegance." The elixir thus began to fall in disrepute, and while in many respects they respond most closely to the maxim of *curare cito, tuto et jucundo*, with a few important exceptions, they are now but little used.

Miscellany

THE AMERICAN PHYSICIAN.

Pointed Criticism of the American Medical Man by a Chinese Visitor.

To look at ourselves and our affairs through the eyes of others is often very enlightening; it is at least suggestive. The *Medical News*, Jan. 7, 1905, quoted a chapter from "As a Chinaman Saw Us," a book published by D. Appleton & Co., New York City, from which we quote certain portions as follows:

"The Americans have made rapid advances in medicine and surgery and they have some extraordinary physicians. From two to four years of study completes the education of some of the doctors, and hundreds are turned out every year. Some are of the old and regular school of medicine, but others are called homeopathic, which means that they give small doses of the more powerful medicines. Then there are those who practice in both schools. Indeed, in no other field does ignorance, superstition, credulity and lack of real education display itself as among the American doctors and healers. I believe I could fill a volume by a mere enumeration of the diabolical and absurd nostrums offered by knaves to heal men who profess to hold in ridicule the Chinese doctors."

After enumerating with astonishment the varieties of healers, as Eddyites, faith curists, spirit doctors, fake hypnotists, water curers, osteopaths, color doctors, electric healers, etc., he continues:

"But the most amazing class comprised the patent-medicine men, who are usually not doctors at all, but buy from someone a 'cure' and then advertise it, spending in one instance which I investigated $1,000,000 a year. Every advantageous wall, stone or cliff in America will be posted. You see the name at every turn, and the gullible Americans bite, chew and swallow.

"It is not overstating facts when I say that three-fifths of the people buy some of these patent nostrums, which the real, medical men denounce, showing that the masses of the people are densely ignorant, the victim of any faker who can shout his wares loud enough. In China such a thing would be impossible; the block would stop the practice; but the Americans assure me that China is a thousand years behind the times, for which let us be devoutly thankful.

"I have not enumerated a tenth of the kinds of doctors who prey on these unfortunate people. There are companies of them who guarantee to cure anything, and skillfully mulct the sick of their last penny. There are retreats for the unfortunate, farms for deserted infants, and homes for unfortunate women carried on by villains of both sexes. There are traveling doctors who go from town to town, who cure 'while you wait,' and give a circus while talking and selling their cures; and in nine cases out of ten the nostrum is an alcoholic drink disguised.

"In no land under the sun are there so many ignorant, blatant fakers preying on the people, and in no land do you find so credulous a throng as in America, yet claiming to represent the cream of the intelligence of the world; they are so easily led that the most impossible person, if he be a good talker, can go abroad and by the use of money and audacity secure a following to drink his salt water, paying a dollar a bottle for it and singing his praises. Such a doctor can secure the names and pictures of judges, governors, senators, congressmen, prominent men and women, officers of the volunteer army, artists, actors, singers—in fact, prominent people of all kinds will provide their pictures and give testimonials which are blazonly published. These same people go to a Chinese drug shop and laugh at the 'heathen' drugs, and wonder why the Chinaman is alive. America has a body of physicians and surgeons who are a credit to the world, modest, conscientious, and with a high sense of honor, but they are as a dragon's tooth in a multitude to the so-called 'quacks' who take the money of the masses and prey on them, protected in many cases by law. No one profession demonstrates the abject credulity of the great mass of Americans as that of medicine. . . .

"Of the best physicians in America one can not say enough in praise. I was most impressed with their high sense of honor. They have an agreement which they call their 'ethics' by which they will not advertise or call attention to their learning. Consequently the lower and ignorant classes are caught by the blatant chaff of the patent-medicine venders and the 'quack' doctors. What the word 'quack' means in this sense I do not quite know; literally it means the cry of a goose. The 'regular doctor' will not take advantage of any medicine he may discover or any instrument; all belongs to humanity, and one doctor becomes famous over another by his success in keeping people from dying. The grateful patient saved tells his friends, and so the doctor becomes known. In all America I never heard of a doctor that acted on the principle which holds among our doctors, that the best way to cure is to watch the patient and keep him well, or prevent him from being taken sick. The Americans in their conceit consider Chinese doctors ignorant fakers; yet, so far as I could learn, the death rate among the Chinese, city for city, country for country, is less than among Americans. The Chinese women are longer lived and less subject to disease. In what is known as New England, the oldest well-populated section of the country, people would die out were it not for the constant accession of immigrants. On the other hand, the Chinese constantly increase, despite a policy of non-intercourse with foreigners. The Americans have, in a civilization dating back to 1492, already begun to show signs of decadence, and are only saved by constant immigration. China has a civilization of thousands of years, and is increasing in population every day, yet her doctors and their methods are ridiculed by the Americans. The people have many sayings here, one of which is, 'The proof of the pudding lies in the eating.' It seems applicable to this case."

Correspondence

Osteopathy.

CLEVELAND, OHIO, March 22, 1905.

To the Editor:—I have noticed that in articles relative to osteopathy, the profession makes the claim that it is "massage" or "Swedish movements" or something akin to these, and that the osteopath as specifically denies this and says that, although there is a similarity in these various systems of mechanotherapy and osteopathy, yet "there is a difference essential in kind and fundamental in importance." His statement is probably not true, but the question as to what oste-

opathy is does not seem to be the essential point to determine, but rather what is the value of his method. If it is a worthy system of healing it should be recognized and used, while if its claims are false it is criminal to allow the practice.

The followers of this "school" affirm that "osteopathy is still in its infancy," and yet they claim that nearly or quite all diseases are amenable to its influence! Diagnoses are made and treatment given by operators who are nominally required to give but twenty (20) months to the study of the method. Those operators are sincere in their belief—the majority of them. Their school teaches them to be quite optimistic in osteopathy and always pessimistic in everything else. It is useless to appear before courts and to affirm that osteopathy is massage, etc., for this does not affect their claims that they effect cures. Likewise, nothing is gained by placing a dead lamb on the witness' table and challenging the operator to move bones. Such opposition only goes to support their statements that the theories and methods of their practice are not understood.

Usually when scientific claims are made it is customary to furnish the evidence for such, but in no osteopathic text-book am I able to find even one original experiment on which a claim is based, and their theory is one which demands physiologic proofs. So far as I know, no osteopathic school gives a course in experimental physiology—the Kirksville school perhaps schedules one, but does not give it. Their "science" is based on theory alone, and yet the operators have pushed forward their views with an enthusiasm which one would expect to be backed by far stronger arguments than the one usually given—"we get results." It would seem that the only reasonable method for determining the value of osteopathy lies in a thorough experimental research of its theories and the fact that this is not done by osteopaths themselves does not relieve the medical profession of this duty.

Osteopathic theories change, and the teachings of a few years ago are now obsolete—perhaps criticism has accomplished this—and may not the present claims of osteopaths be decidedly modified if some one who has the time and opportunity will make a complete study of their tenets. The results would be interesting—and valuable. E. F. WAKEFIELD.

Straw Charcoal Dressings of the Japanese.

BROOKLYN, N. Y., March 20, 1905.

To the Editor:—I am greatly interested in an item under the above title which appeared in THE JOURNAL, March 4, page 731. In this item credit is given to Surgeon-General Kikusi for having first suggested the use of charcoal for primary dressings in such cases. As you will see by enclosed extract from reprint of a paper read at the International Medical Congress in London, 1881, I must lay claim to originality as to suggestion and technic, viz.: "I believe a large amount of these septic complications is due to the direct infection"; and after some explanatory remarks, urged the following substitute for the ordinary bandaging: "Among almost all continental nations charcoal is largely used, and everywhere available, and easily obtained; I would suggest, then, after operation, the instant envelopment of the wounds, particularly those of the limbs, and especially, as I think, those of the lower limbs, in a sack or bag (a common, small pillow-slip would serve) of charcoal, finely pulverized; a fair excess of this to be used, so as to shield and envelop the tissues; the charcoal to be either directly laid on the wound or mediately, a fold of some dressing, gauze, book muslin, or the like, being applied next the surface; this not to be removed for days at a time, except under pressing necessity, and then preferably by a jet of water from some clean source; the same form of dressing to be reapplied thereafter when necessary." The paper mentioned was published in full in the *New York Medical Journal*, October, 1882, under heading, "A Ready and Convenient Antiseptic Dressing for Amputation and Other Open Wounds in Field Hospitals." A supplementary paper on the same subject was published by me in the *Medical Record*, Jan. 30, 1897. S. SHERWELL, M.D.

The Oldest New Hampshire Practitioner.

WORCESTER, MASS., March 21, 1905.

To the Editor:—In THE JOURNAL, March 11, 1905, in the list of deaths it is stated that Alvah R. Cummings, M.D., aged 78, Dartmouth Medical College 1853, was the oldest practitioner of New Hampshire and the oldest member of the New Hampshire Medical Society. I wish to correct the last two statements, for, so far as my knowledge goes, that honor belongs to my friend and former colleague, William Waterhouse, M.D., of Barrington, N. H., now in his eighty-ninth year. He was born Aug. 28, 1816, graduated from the Medical Department of the University of New York in 1842, and joined the New Hampshire Medical Society in 1860, twenty-one years before Dr. Cummings joined the same society. Dr. Waterhouse has been in constant practice up to within a year and is now enjoying good health. He is ten years the senior of the late Dr. Cummings. R. J. WARD.

Memorial to Dr. N. S. Davis.

HARTFORD, CONN., March 20, 1905.

To the Editor:—The American Medical Society for the Study of Alcohol and Other Narcotics has arranged to hold a memorial meeting in memory of the late Dr. N. S. Davis of Chicago at Portland, Ore., July 11, 1905. An entire evening will be devoted to commemorative addresses and papers on the life and work of Dr. Davis. Dr. H. O. Marcy, Boston, will deliver a memorial oration, which will be followed by addresses by Drs. Webster, Hall, Crothers, Hollister, Didama and others. Arrangements are being made to establish a memorial lectureship to the work and memory of Dr. Davis to be delivered annually at the sessions of the Association.

T. D. CROTHERS.

An Explanation.

LOUISVILLE, KY., March 28, 1905.

To the Editor:—In our efforts to place before the medical profession testimony of the highest character from physicians who have used our preparations (formula published), we issued postal cards bearing a testimonial given us several years ago by Dr. Lewis S. McMurtry, President-elect of the American Medical Association. Dr. McMurtry was not aware that these cards were issued, and, of course, had never given his consent or approval. On receiving a protest from him, we immediately ceased issuing the objectionable cards, and we desire to offer voluntarily this explanation.

GEORGE A. NEWMAN CO.
By ADDISON DIMMITT, Sec'y.

Praises Improved Arrangement of Journal Digest.

LAWRENCE, MASS., March 21, 1905.

To the Editor:—I can not forbear expressing my satisfaction at the changed position of digest and contents in THE JOURNAL. The placing of the second page of contents directly after the first without intervention of advertisements is much more convenient and professional in appearance.

W. H. MERRILL, M.D.

Association News

Portland Session Worth Attending at Great Trouble and Expense.

From both points of view—the opportunities of the session and the attractiveness of the trip—the Portland session should be one of the most largely attended in the history of the Association, predicts the *Medical Fortnightly*. No argument is needed to convince regular and occasional attendants that the scientific worth of the sessions wherever held, always abundantly repay for all expenses and inconveniences incurred; the Portland session will be no exception to this rule, the program promised will be interesting and instructive in a high degree to workers in all lines of medical science—a better has never been prepared; add to this

the opportunity of rubbing shoulders with the men who are doing things in medicine, and it needs no more to convince one that one's presence will have been abundantly worth while. But while the scientific is the foremost aim and object of the session of the Association, it is also a fact that a good majority of those who attend make the occasion a time for recreation and sight-seeing. Never have greater opportunities been offered for this than are at our command this year. The Portland Exposition will be in size and attractiveness in the class of that at Buffalo; the chief criticism of the St. Louis Exposition was that it was so large that it could not be seen in less than a month and that its very immensity was a disadvantage; Portland's will be free from this criticism, but will furnish an abundance of natural and artificial beauties and such a mass of scientific, art, industrial and natural exhibits as must prove interestingly entertaining and satisfying. Profiting from the experience of former exposition cities, Portland will be better able to care for her guests than ever before has been done; hotel and private accommodations will be abundant at very reasonable rates.

Marriages

JOHN D. MILLER, M.D., Dayton, Ohio, to Miss Julia Kelly of New York, January 20.

JAMES T. BLACK, M.D., to Miss Alda M. Anderson, both of Elroy, Texas, February 22.

HERBERT NORRIS, M.D., to Miss Harriet W. Frothingham, both of Philadelphia, March 15.

FOWLER BORDER, M.D., Mangum, Okla., to Miss Maude Holcomb of Hobart, Okla., February 22.

SAMUEL SCHULTZ, M.D., Coldwater, Mich., to Miss Annie Bacon, at Chelsea, Mich., March 18.

JAMES MCFADDEN, M.D., Appleton, N. Y., to Mrs. Arian T. Benton of Saratoga, N. Y., March 7.

HENRY KENNON DUNHAM, M.D., to Miss Amelia Smith Hickenlooper, both of Cincinnati, March 14.

JOHN RANKIN MCELROY, M.D., Jonesville, N. Y., to Miss Clair Ella Tanner of Cohoes, N. Y., March 8.

J. H. MORGAN, M.D., Dighton, Kan., to Miss Lettie Bargdall of Chillicothe, Mo., at Kansas City, March 18.

Deaths

Russell Murdoch, M.D. University of Virginia Medical Department, Charlottesville, 1861, of Baltimore, surgeon in the Confederate service during the Civil War, one of the founders of the Baltimore Eye, Ear and Throat Hospital; formerly lecturer on diseases of the eye and ear in the University of Maryland, and professor of diseases of the eye, ear and throat in the Woman's Medical College, Baltimore; a member of the Medical and Chirurgical Faculty of Maryland, American Ophthalmological Society and American Otological Society, died at Johns Hopkins Hospital, Baltimore, March 19, from cerebral hemorrhage which occurred just after he had completed an operation the previous afternoon, aged 66.

Michael H. Brophy, M.D. Laval University Medical Department, Quebec, 1885, dean of the College of Physicians and Surgeons of Quebec since 1898 and one of the founders of the *Bulletin Médical de Québec* and of the Association of French-Speaking Physicians of North America, died at his home at Ste. Foye, Quebec, February 24, from pneumonia, after a short illness, aged 45.

Amos Harrison Brundage, M.D. New York University, New York City, 1855, a member of the New York State Medical Association, surgeon of the One Hundred and Seventy-ninth New York Volunteer Infantry and Sixth New York Volunteer Cavalry in the Civil War, died March 22 at his home in Brooklyn, N. Y., from cerebral hemorrhage, aged 76.

Andrew W. Patterson, M.D. Pennsylvania Medical College, Philadelphia, 1841, founder of Eugene City, Ore., member of the territorial legislature, state senator in 1870, surgeon during the Rogue River Indian campaign of 1885-1886, for three terms superintendent of schools of Lane County, died at his home in Eugene City, Dec. 20, 1904, aged 90.

Willis P. Spring, M.D. Harvard University Medical School, Boston, 1879, a member of the American Medical Association, formerly coroner and county physician of Hennepin County, Minn., died at his office in Minneapolis from accidental asphyxiation by gas, March 22, after lying unconscious for sixty hours, aged 50.

Thaddeus W. Johnson, M.D. Vanderbilt University Medical Department, Nashville, Tenn., 1885, some-time state senator, alderman, president of the Board of Education, and twice mayor of South Pittsburg, Tenn., died March 16 at his home in that city from nephritis, after a protracted illness, aged 52.

Frank Dulin, M.D. St. Louis College of Physicians and Surgeons, 1882, a member of the American Medical Association, police surgeon of Denver, died at the Emergency Hospital, Denver, March 14, two days after he had been shot while in the execution of his duty by an insane criminal.

Benjamin B. Lenoir, M.D. Jefferson Medical College, Philadelphia, 1846, a member of the American Medical Association, and for nearly sixty years a practitioner of Loudon County, Tenn., died at his home in Lenoir City, March 13, from pneumonia, after an illness of one week, aged 84.

John S. Briggs, M.D. University of Nashville (Tenn.) Medical Department, 1889, died at his home in Bowling Green, Ky., March 17, from acute meningitis after an illness of two weeks, aged 38. He retired from practice several years ago on account of ill health.

Samuel B. Hoppin, M.D. Jefferson Medical College, Philadelphia, 1852, surgeon in the Navy during the Civil War, for thirty years registration physician in the prothonotary's office, Philadelphia, died at his home in that city, March 21, aged 86.

George W. Phillips, M.D. Indiana Medical College, Laporte, 1846, surgeon of the Seventy-fifth Illinois Volunteer Infantry in the Civil War, died at his home in La Junta, Colo., March 17, from the effects of a fracture of the femur fifteen months before, aged 83.

John A. Smith, M.D. Medical Department of Western Reserve University, Cleveland, 1881, some-time coroner and physician of Lawrence County, Pa., died at his home in New Castle, March 21, after an illness of several months, aged 49.

Alexander F. H. Gale, M.D. College of Physicians and Surgeons in the City of New York, 1887, of New York City, died at sea on the steamer *Trinidad*, on which he was taking a trip for his health, March 17, from influenza, aged 35.

George Adams Bright, M.D. Harvard University Medical School, Boston, 1860, rear admiral U. S. Navy, retired, formerly in charge of the Naval Hospital, Washington, died at his home in that city, March 12, aged 67.

Abraham S. Brubaker, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1877, died at his home in Indianapolis, March 16, from the effects of injuries received in a fall a year ago, aged 52.

John A. Gregg, M.D. Dartmouth Medical School, Hanover, N. H., 1883, of Somerville, Mass., died in the Massachusetts General Hospital, Boston, March 14, from heart disease, after an illness of two weeks, aged 56.

Samuel B. McCleery, M.D. Jefferson Medical College, Philadelphia, 1871, of Lancaster, Pa., died at the general hospital in that city, March 21, from cerebral hemorrhage, after an illness of two weeks, aged 56.

Robert Harris Awl, M.D. Pennsylvania Medical College, Philadelphia, 1842, treasurer of Northumberland County, Pa., in 1864 and 1865, died at his home in Sunbury, March 13, from influenza, aged 85.

John C. Scott, M.D. College of Physicians and Surgeons, Keokuk, Iowa, 1870, of St. Catharine, Mo., died at the State Hospital for the Insane No. 2, near St. Joseph, Mo., March 14, from paresis, aged 64.

Moses Richardson, M.D. Jefferson Medical College, Philadelphia, 1856, surgeon of the Forty-second Georgia Infantry, C. S. A., during the Civil War, died at his home in Norcross, Ga., March 15, aged 75.

Gustavus A. Doren, M.D. Berkshire Medical College, Pittsfield, Mass., 1859, superintendent of the Ohio Institution for the Feeble-Minded, Columbus, died at his home in that city, March 23, aged 67.

William Robert Reud, M.D. Department of Medicine of the University of Pennsylvania, Philadelphia, 1869, was found dead in the rooms of his nephew in Boston, February 1, from angina pectoris, aged 69.

Horace **D. Allen, M.D.** Castleton (Vt.) Medical College, who retired from practice in 1875, died at his home in Rutland, Ill., February 19, from cardiac asthma, after an illness of four weeks, aged 79.

Henry **A. B. Klippel, M.D.** Missouri Medical College, St. Louis, 1899, of St. Louis, died at quarantine, March 17, from smallpox contracted while attending a patient, after a short illness, aged 29.

William **Harris, M.D.** Jefferson Medical College, Philadelphia, 1891, once postmaster at Hamburg, Pa., died at his home in that city from pneumonia, March 19, after an illness of one week, aged 62.

George **M. Armstrong, M.D.** Jefferson Medical College, Philadelphia, 1871, died at his office in St. Louis, March 23, from an overdose of morphin, taken with suicidal intent, aged 58.

John **J. Garland, M.D.** The University and Bellevue Hospital Medical College, New York City, 1899, died at his home in Syracuse, N. Y., March 20, after a long illness, aged 31.

Eleanor **McAllister, M.D.** College of Medicine, Syracuse, (N. Y.) University, 1888, of Redding, Cal., died at a hospital in San Francisco, March 19, after an operation, aged 40.

Carter **Berkeley, M.D.** College of Physicians and Surgeons, Baltimore, of Staunton, Va., died suddenly in the Beverly Club in that city, March 7, from heart disease, aged 67.

Hugo **Koethe, M.D.** Erlanger University, Germany, 1874, died at his home in Williamsburg, Brooklyn, N. Y., March 16, from heart disease, after an illness of one month, aged 53.

Ivan **E. Amilon, M.D.** Jefferson Medical College, Philadelphia, 1896, formerly of Philadelphia, shot and killed himself, March 8, at his room in Chicago, while despondent.

Theodore **C. Dolan, M.D.** Detroit College of Medicine, 1904, of Lima, Ohio, died at St. Mary's Hospital, Detroit, from tuberculosis of the kidneys, March 21, aged 25.

John **Brill, M.D.** Tulane University of Louisiana Medical Department, New Orleans, 1872, died at Silver Creek, Miss., March 7, from cerebral hemorrhage, aged 50.

William **D. Taylor, M.D.,** who served in the Philippine Islands as surgeon of the California Heavy Artillery, died at his home at Alameda, Cal., Nov. 11, 1904.

George **E. Elley, M.D.** Bellevue Hospital Medical College, New York City, 1869, died suddenly at his home in West Line, Mo., from heart disease, March 14.

Frank **Newell Armstrong, M.D.** Rush Medical College, Chicago, 1890, of Richmond, Ill., died suddenly in Morris, Ill., from heart disease, March 13, aged 38.

William **E. Treadwell, M.D.** Chicago, 1884, of Maple Park, Ill., died in Elgin, Ill., March 17, from cerebral hemorrhage, after an illness of one week, aged 54.

Alexander **L. Wilson, M.D.** Missouri Medical College, St. Louis, 1884, died at his home in Tulare, Cal., March 17, after an illness of seven months, aged 45.

Richard **Hamilton Thompson, M.D.** University of Maryland School of Medicine, Baltimore, 1839, died at his home in Washington, D. C., March 21, aged 86.

John **F. Hickey, M.D.** Medical College of Indiana, Indianapolis, 1871, died at his home in Chanute, Kan., March 14, from cerebral hemorrhage, aged 62.

C. **J. Armstrong, M.D.** Cincinnati, 1854, died at his home in Bassett, Neb., from general paresis, February 19, after an illness of one year, aged 76.

Edward **M. Beardsley, M.D.** Medical Institution of Yale College, New Haven, Conn., 1845, died at his home in Monroe, Conn., March 12, aged 82.

James **H. Stanton, M.D.** St. Louis College of Physicians and Surgeons, 1898, died March 22 from typhoid fever at his home in Prairie du Chien, Wis.

George **F. Corse, M.D.** University of Maryland School of Medicine, Baltimore, 1864, died at his home in Gardenville, Md., March 23, aged 65.

Edwin **Oliver, M.D.** University of the Victoria College, Coburg, Ont., 1866, died recently at his home in Sarnia, Ont., and was buried March 14.

John **P. Lombard, M.D.** New York University, New York City, 1888, died at his home in Boston, March 21, from heart disease, aged 44.

C. **Edwin Wright, M.D.** Pennsylvania, 1883, of Philadelphia, died at Deland, Fla., March 16, from cerebral hemorrhage, aged 58.

Willis **L. Bartholomew, M.D.** New York, 1886, formerly of Canastota, N. Y., died at Middletown, N. Y., Nov. 25, 1904, aged 40.

William **F. Bland, M.D.** Jefferson Medical College, Philadelphia, 1849, died at his home in Baltimore, Dec. 25, 1904, aged 77.

William **N. Bonesteel, M.D.** Albany (N. Y.) Medical College, 1863, died at his home in Troy, N. Y., March 20, after a long illness.

Hudson **B. Stevens, M.D.** Starling Medical College, Columbus, 1854, died recently at his home in Columbus, Ohio.

John **Dow Lance, M.D.** Ohio, 1877, died at his home in Providence, R. I., March 17, aged 54.

J. C. Bates, M.D., died recently at his home in Silver City, Ark.

Book Notices

STUDIES IN GENERAL PHYSIOLOGY. By Jacques Loeb, Professor of Physiology in the University of California. The Decennial Publications. Second Series. Vol. XV. Parts 1 and 2. Cloth. Pp. 782. Price, $7.50 net. Chicago: The University of Chicago Press. 1905.

The decennial publications of the University of Chicago are issued in commemoration of the completion of the first ten years of the university's existence, and the two volumes before us contain Professor Loeb's articles on various topics in general physiology. Many of the papers here collected—indeed, the majority—originally appeared in German. These have been translated. Probably to the regret of many, joint papers by Professor Loeb and others have been omitted. As it is, we have here within easy reach and in convenient form the choice products of this original investigator, in a new field, up to the time that he left the University of Chicago (1903). All progressive medical men, especially teachers, who have not made themselves familiar with Loeb's investigations as the results have been published from time to time, will be gratified to learn that his scattered publications are now easily accessible. This is not the place to review critically a collection of papers the general nature of which may be assumed to be familiar to many of the readers of THE JOURNAL. The leading idea that permeates all the work is control of life phenomena. The agencies that determine the direction of motion in animals are considered in one series of papers. In order to find some means of control of the phenomena of regeneration efforts were made, and successfully, to cause one organ to grow at will in the place of another. Again, in the case of the problem of fertilization, the first step toward its solution has been taken by the production by various means of larvæ from the unfertilized eggs of various classes of animals. The fundamental character of the problems that Loeb has attacked with so great success by physico-chemical means gives to his work a significance for pathology and pharmacology that will be appreciated more and more as medical students and physicians become acquainted with the principles involved. Undoubtedly these volumes (which under the circumstances reflect great credit on the university under whose auspices they are issued) will serve to draw the interest of teachers in medical colleges and of educated physicians in general to this new field of physiologic investigation.

UNIVERSAL CYCLOPEDIA AND ATLAS. Charles Kendall Adams, LL.D., President of the University of Wisconsin, Editor-in-Chief, assisted by a corps of associate editors, composed largely of eminent specialists in Europe and America. A newly revised and enlarged edition. Rossiter Johnson, Ph.D., LL.D., Editor of Revision. Illustrated with color plans, plates and engravings. Complete in twelve royal octavo volumes. Half morocco. Price, $84.00. New York: D. Appleton & Co. 1904.

This is one of the best encyclopedias now obtainable. It has been thoroughly revised and seems, as far as we have examined it, to have been brought up to date. We find the *x*-ray, the Becquerel ray and other late matters thoroughly treated. Medical science is represented by special articles and by the supervision of eminent authorities; among the latter we notice Drs. H. C. Wood, H. A. Hare, Leonard Pearson, George A. Piersol, W. T. Councilman, G. E. de Schweinitz, Guy Hinsdale, St. John Roosa, Seneca Egbert, B. C. Hirst, Roswell Park,

Henry M. Hurd, etc. We note as one example that the article on "Comparative Anatomy" covers twenty-five pages; another example is the subject of "Bacteriology," which is described in five pages, including an excellent colored plate. This has been written by Drs. A. C. Abbott and J. S. Billings, and is an excellent presentation. The encyclopedia contains biographies of eminent men in medicine, as well as of those in other walks in life. Turning from the medical side—the encyclopedia deserves a place in the physician's library, because of its general information on all subjects that a book of this kind conveys. The physician will be able to consult this with satisfaction and convenience, in looking up the various questions that come to him either on the borderline of medicine or entirely apart from it. The paper is excellent; the print is clear; each heading is in black type which stands out clearly, and the illustrations, especially the colored plates, add greatly to the value of the work. We wish to call particular attention to the bibliographies, which are given in connection with all the important subjects, and which enable the reader to pursue the study of the subject elsewhere. We can thoroughly recommend this work.

MANUAL OF ROENTGENOLOGY. Röntgenologisches Hilfsbuch. Eine Sammlung von Aufsätzen über die Grundlagen und die wichtigsten Hilfsmethoden des Röntgenverfahrens. Mit einem Anhang über Radiokivitat. Mit 33 Abbildungen. Ingenieur Friedrich Dessauer. Paper. Pp. 136. Price, 3.50 marks. Würzburg, A. Stuber's Verlag. 1905.

Dessauer's name is frequently seen in medical journals signed to articles on the technic of Roentgen ray treatment. Some of the articles were written in collaboration with physicians. They are here collected, with others published elsewhere, all illustrated. Among them are the following: "The Diaphragm Process and Its Combination with Orthodiagraphy," "Sources of Electricity for Roentgen Work," "Interrupters," "Spark Length," etc., and a theoretical study of radioactivity. He regards the radioactive substances as bodies of extremely high atomic weight whose atoms have lost their stability in the existing phase of the development of the earth. The electrons of their atoms are at present in a transitional stage.

Isthmian Sanitation

THE PANAMA CANAL MISMANAGEMENT.

Reply of the Commission to the Charges Made in the Report to the Government by Dr. Charles A. L. Reed.

At the request of the Isthmian Canal Commission we print in full its reply to the report of Dr. C. A. L. Reed, chairman of the Committee on Medical Legislation of the American Medical Association, which was printed in THE JOURNAL, March 11, page 812.

WASHINGTON, D. C., March 16, 1905.

Hon. William H. Taft, Secretary of War.

SIR:—The commission has given such consideration to the letter addressed to you under date of March 2, 1905, by Dr. Charles A. L. Reed as time that could be spared from the urgent duties of the office since its receipt on March 7 has permitted.

The letter is so full of misstatements that it has been thought advisable to answer it at considerable length even though the tone thereof should be sufficient evidence that it is the product of a strangely biased mind.

The Health Department was preliminarily organized in May, 1904, a few days after the canal properties came into possession of the United States. The permanent organization of this department was under consideration during the stay of the commission on the Isthmus in the summer of 1904, during all of August, having been adopted on September 2. Commissioner Grunsky took a special interest in the affairs of the Health Department and in the sanitary work on the Isthmus and assisted the medical staff in planning the permanent organization, being in frequent conference with the physicians and submitting to the commission the result of the deliberations. It was at once apparent to the commission that it would not be possible to accept in their entirety the recommendations and suggestions made by the chief sanitary officer, which included such matters as the immediate taking over and management by the United States of the San Tomas Hospital, one of the public institutions of the Republic of Panama, located in Panama; the taking over and management of the poorhouse of Panama called Asilo de Bolivar; the taking over of the Lazarette or home of lepers.

Dr. Reed's assertion that "much of the report on a plan of organization was formulated over the respectful protest of the medical men" is without any foundation whatever. Modifications of the suggestions submitted by the medical staff were made from day to day until a plan acceptable to both the commission and to the medical staff was worked out which must stand on its merits. It may at once be stated that one of its chief merits lies in its elasticity. The facilities immediately provided and to be provided were those foreseen to be necessary within the time during which plans of the canal were to be under consideration, and during which there would be only a moderate force at work on actual canal construction.

In order that the character of modifications of the scheme as submitted by the chief sanitary officer may be understood, one illustration may suffice. He had suggested the establishment and equipment of twenty emergency hospitals (these being apart from the hospitals at Ancon and Colon) with twenty beds each, and the necessary staff of employes to be located along the line of the canal, that is, one every two miles between Panama and Colon. Without venturing to pass on the ultimate necessity for this number of emergency hospitals, it was decided that it would be better to establish only three at the outset, each with less than twenty beds. These were to be located at centers of population and to be enlarged and others were to be established and equipped as should later be found necessary.

The following from the report on the plan of organization refers to this matter:

> Emergency hospitals will be required along the line of the canal as soon as large numbers of laborers are concentrated at the points where the work is of the greatest magnitude. At each of these hospitals a physician should be stationed. Each emergency hospital should be suitably equipped for emergency service and should have combined with it a dispensary.
>
> It is assumed by the chief sanitary officer that there will be need ultimately for twenty of these hospitals, with twenty beds each, but after careful consideration of the matter it was decided that necessity does not exist for more than three at present, and that others can be added as required.

Other modifications of the submitted scheme of a like character were made in a like spirit, and in every case the matter involved was fully discussed with and concurred in by the medical staff.

The joint participation of all the commissioners in the formulation of the plan of organization is sufficiently evidenced by the adoption of the report on this matter without modification. The organization of the Department of Health, as perfected, except possibly the Board of Health feature, which originated with the commission's general counsel, seemed to be highly satisfactory to the chief sanitary officer and his associates and met with their entire and full concurrence.

The spirit which pervades the plan of organization is well illustrated in the first paragraph of the report thereon which was subsequently adopted:

> After repeated conferences with the Chief Sanitary Officer, Dr. Gorgas; Director of Hospitals Dr. Ross; the Superintendent of Ancon Hospital Dr. LaGarde; Chief Quarantine Officer Dr. Carter; Chief Sanitary Inspector of the Canal Zone Mr. LePrince; the Superintendent of Colon Hospital Dr. Spratling, and the Supervising Architect Mr. Johnson, it has been agreed to be desirable to perfect an organization of the Department of Health as herein set forth, which will be sufficiently elastic to permit of expansion or contraction as conditions on the Isthmus may, from time to time, require. The needs of the first year of service and the conditions prevailing during the time of preparation for canal work on a large scale were, therefore, used as a guide in determining the scope of the work to be done and the personnel which should be authorized.

As Dr. Reed comments unfavorably on the commission's department of material and supplies, it should be briefly stated that this department was created for the purpose of receiving, storing, caring for and issuing supplies and materials, includ-

ing those for the medical department and for the care of machinery not in use. It naturally works in conjunction with the commission's purchasing and shipping department. Dr. Reed says that in the resolution creating the material and supplies department nothing is said about the Sanitary Department, thereby giving the impression that by some oversight a right of inspection accorded other departments has been denied to the Sanitary Department as such, and that the Health Department will be hampered in securing suitable medicines and supplies. Dr. Reed should have continued his quotation by adding the following, which appears in the printed proceedings of the commission's meeting of Aug. 28, 1904:

In the organization of a general purchasing department, provision could well be made for at least one competent clerk who is familiar with the requirements of sanitary and hospital service. Purchases of medical supplies and instruments could be just as carefully made as through an independent office. All supplies and medical stores should be consigned to the general storekeeper of the commission, and should by him be at once transferred to a subdepartment and possibly a separate storehouse, where they could be kept apart from other stores.

The commission, in the making of its first purchases for the Health Department, gave the medical staff authority to purchase in open market whatever was necessary. In the making of subsequent purchases it called on Col. Turrell, medical purveyor, U. S. A., at New York, for assistance, chiefly with a view to the issuance of clear specifications for supplies and medicines, and still later an arrangement was made with Surgeon-General Wyman, of the United States Public Health and Marine-Hospital Service, under which all requisitions for medicines, surgical instruments and supplies are referred to that department and are filled by it.

It was that department which made the purchase of the *x*-ray outfit, in reference to which Dr. Reed makes statements that are quite erroneous. He states that a request was made in Washington by the Health Department's expert to be allowed to select the Crookes tubes of an *x*-ray outfit, and that this request was peremptorily refused. This statement evidences either woeful ignorance or a willful misstatement of fact, and the Doctor tries to make matters appear still worse by stating that although no *x*-ray outfit had reached the Isthmus, the salary of the expert who had been specially employed to do *x*-ray work in Ancon goes on. This expert is Dr. Herrick, who is the pathologist at Ancon Hospital and who will have charge of such instruments and appliances as are required in the laboratory, including the *x*-ray outfit. Full service is being rendered by Dr. Herrick in his capacity as pathologist for the salary which still goes on.

No request to assist in the selection of the *x*-ray outfit or of the Crookes tubes was denied; on the contrary, Dr. Herrick was told that any service he desired to render in the selection of such apparatus or of microscopes would be welcomed by the commission. Dr. Herrick, in November, 1904, came to the Washington office with a letter from Dr. LaGarde, superintendent of Ancon Hospital, from which the following is an extract:

Mr. Herrick leaves here to-morrow for a much-needed rest. He has aided me more than any one in the organizing of our important hospital. I desire very much that he should be consulted by the purchasing agent in New York in the purchase of microscope, *x*-ray and operating-room supplies that are costly and that must be of certain standards and quality to suit our needs. No one but an expert like Herrick can intelligently do such purchasing, and I write to ask if you will be kind enough to give him a letter to Mr. Anderson, explaining the necessity of such advice, or, in fact, let Herrick do the soliciting himself.

This letter, addressed to the chairman of the commission, was presented in person to the acting chairman, and Mr. Herrick was told that the commission would be glad to accede to the request of Dr. La Garde and requested his assistance in the matter. Dr. Herrick was informed that the matter of soliciting proposals was no longer in the hands of Mr. Anderson. He was referred to Mr. Redfern, the chief clerk of the commission, in direct charge at that time of the filling of requisitions. In this connection Mr. Redfern, on being requested to state what happened thereafter, says, in reference to the purchase of microscopes, apochromatic-objectives and an *x*-ray outfit, that these comprised one dissecting microscope, Leitz No. 44; three ordinary microscopes for hospital use and one Zeiss microscope complete beside the objectives, compensating eye-pieces and a Spencer Lens Company's new No. 4 stand. He states that the requisition for these instruments were being handled at the time of Dr. Herrick's visit to Washington, that Dr. Herrick was referred to him (Redfern) by the acting chairman, and that he (Redfern) was instructed to consult Dr. Herrick and obtain his views as to what he desired to do in the matter before making any purchases or definite arangements in regard to the Zeiss microscope and *x*-ray outfit. Mr. Redfern further says that he was present at a part of the interview between the acting chairman and Dr. Herrick, and that Dr. Herrick expressed a desire to superintend, to a more or less degree, the purchase of the instruments referred to; that Dr. Herrick called on him (Redfern) on the following day (as he remembers) and was requested to give the matter of the purchase of the microscope and the *x*-ray outfit his attention; that for personal reasons it was not convenient for Dr. Herrick to give these purchases the required attention; moreover, that even in the case of the *x*-ray outfit there were several makes equally as good as the one specified, any one of which would suit him. Mr. Redfern further states that the dissecting microscope, Leitz No. 44, was bought from Ernest Leitz of New York, after having referred the matter to the Public Health and Marine-Hospital Service for advice. The three ordinary microscopes were purchased for the commission by the Public Health and Marine-Hospital Service, the style purchased being the "Continental," and the firm from which they were purchased was Bausch & Lomb of New York. The apochromatic objectives, the Zeiss microscope and the *x*-ray outfit were bought by the Public Health and Marine-Hospital Service. It was understood that these instruments would be tested for the Public Health and Marine-Hospital Service by the director of the hygienic laboratory of that service at Washington.

It is stated by Dr. Reed that the commission substituted a number of worthless microscope objectives for others carefully specified. The purchase of these has above been explained. The commission has at no time authorized the substitution nor the acceptance of any "worthless" instruments.

Dr. Reed says that one medicine is substituted for another in practically every requisition for medicine that has reached the hospital. The commission knows of no such substitution. It has been aided, as explained, by Colonel Turrell, the medical purveyor for the U. S. A., and by the Public Health and U. S. Marine-Hospital Service, and it has no grounds for assuming that either of these departments should have sanctioned the purchase of medicines other than those asked for, nor have its medical officers ever reported such a substitution.

The statements of Dr. Reed that a request to have an expert select Crookes tubes was denied; that no *x*-ray outfit was purchased; that worthless apparatus was substituted by the commission for that specified; that the commission foisted remedies on the medical service other than those specified, are all absolutely false.

Relating to Dr. Reed's statement that the commission wants cheap physicians on the Isthmus, only $50 per month being allowed for the internes, the fact is that graduates from medical colleges without experience are useful as internes in the hospital organization on the Isthmus as they are in hospital organization in the United States. In the United States they serve a year without pay. It was thought proper to allow them transportation to the Isthmus from a United States port and to allow them $50 per month during their year of service, and to return them free of expense to the United States at the end of the year or in case of disability due to sickness. Should it be found that an interne desires to remain in the Isthmian service, the assignment to further duty carries with it pay of at least $125 per month. To the above compensation for internes there is added quarters, board and some laundry. Nor is there any reason why a physician promoted from an interneship should not, if he is deserving, be recommended at once for higher pay than $125 per month, which has been named as a minimum. It is true that internes are expected to remain a year to entitle them to free return transportation, but after six months of satisfactory service they

are entitled to any reduced rates of transportation available to the commission ($25 to New York or New Orleans). That the commission does not seek cheap medical service is further answered by quoting the salaries fixed six months ago for such service: Chief sanitary officer, $7,500 per year; executive officer in the office of the sanitary officer (a physician), $2,400; director of hospitals, $7,000; superintendent of Ancon Hospital, $6,000; pathologist and *x*-ray specialist at Ancon, $4,000; physiologic chemist at Ancon, $3,000; two other physicians at $2,400; and two at $1,500; and internes at $600; superintendent of Colon Hospital, $4,000; surgeon and pathologist at Colon, $3,000; three other physicians, $2,400; internes, $600; physicians at emergency hospitals along the line of the canal, $2,400; at dispensaries, $1,800; chief quarantine officer, $6,000; other quarantine officers, two at $3,500; two at $2,400; Panama health officer, $3,000; assistant health officer, $1,800; Colon health officer, $2,400. In addition to this all physicians are allowed quarters or in commutation of quarters 15 per cent. of their pay, and the commission's principal representatives on the Isthmus are allowed carriages.

In the matter of director of hospitals, which you are told was abolished, there has been no abolishment of the office, although the commission did request from its chief sanitary officer after the resignation of Dr. John Ross, because of ill health, a suggestion for the reorganization of his office, which reorganization should provide for an assistant chief sanitary officer in lieu of the director of hospitals. In view of the fact that the laws of the canal zone creating the office of director of hospitals can no longer be amended by the commission, it is not likely that further steps in this matter will be taken.

The non-allowance of twenty sanitary inspectors to serve in the canal zone under the chief inspectors was one of the modifications of the suggestions of the chief sanitary officer already alluded to. On this subject the report on the plan of organization may be quoted:

> No work to be done by the sanitary force on the Isthmus is of greater importance than that which, by restricting the breeding of anopheles and stegomyia mosquitoes, will reduce the danger of malarial and yellow fever infection. This work is now in charge of the chief sanitary inspector, under whom there are four assistant inspectors, more being at once required. . . . An efficient beginning can be made with eight inspectors in the canal zone, and these should be provided.

These were provided, together with sixteen sanitary foremen, their number to be increased from time to time as shown to be necessary by experience. To this time no request for an increase has been made by the officers whose experience would guide the commission in such matters.

It is stated by Dr. Reed that screens were asked for for all the buildings in the canal zone; that the commission concluded this to be a totally unwarranted expense and eliminated the proposition. The commission has reached no such conclusion; moreover, it feels itself under obligation not only to provide screens for all buildings owned or controlled by it, but would like to see all buildings where screens would be of any service suitably screened.

The original proposition of the chief sanitary officer to construct screens entirely around the verandas or porches surrounding the Ancon Hospital buildings was modified, as stated by Dr. Reed, but with the consent and full approval of the medical staff, so far as screening only that part of the galleries which will be in use by the patients is concerned. The boarding below the railing or some other means of protecting the screening against accident, remains as a suggestion, and the commission has no information of its final acceptance or rejection by its representatives on the Isthmus.

The statement made by Dr. Reed that such a proposition would carry about ten times the expense of screening is in error. The reduction of aggregate cost resulting from the plan of screening as adopted would amount to many thousands of dollars and would place a large amount of screening under the protection of porches where increased length of serviceability is to be assumed. The cost of boards in the place of screens, instead of being ten times greater, should be compared on the basis of about six (6) cents per square foot for screens as against three (3) cents for boards, apart in each case from the cost of placing these materials.

In the matter of compensation allowed its clerks, which Dr. Reed criticises, the commission has endeavored to secure a fair and uniform classification in its several departments, and the salaries fixed were the outcome of long discussion and deliberation, the intention being to fix salaries for all such service at about 25 per cent. in excess of the amount which like service would command in the United States.

The Doctor states in this connection that "Colonel Gorgas asked for a chief clerk at $1,800, with the object of getting a man who had had experience with him in Cuba; he was allowed only $1,500, for which he could get only an inexperienced man." The salary fixed in the plan of organization for the chief clerk of the chief sanitary officer (see page 171 of the printed proceedings of the commission) is $1,800; the salary of the clerk in the office of director of hospitals called by courtesy chief clerk is $1,500; the salary of the chief clerk of Ancon Hospital is $1,800 per year.

It should be stated that the fixing of salaries of the officers of the Health Department has received careful consideration by the commission. Salaries, in connection with all other matters relating to the organization of the Health Department, were discussed and agreed on in conference with the medical staff and they remain subject to revision. There are, in fact, frequent changes, and it is needless to say that a change invariably means increase. Some of these salaries have hereinbefore been enumerated.

In the matter of the use of movable vessels for night soil, it may be stated that those called for have been purchased. On this subject, after discussing the advantages and disadvantages of disposal by water carriage in sewers as against the use of a bucket system, Dr. Gorgas, under date of January 7, concluded:

> I would therefore recommend that in general, for the strip, the bucket system be adopted, and that the Sanitary Department be authorized to install the same as necessity arises.

Hereon Governor Davis took up the question, writing under date of January 17 among other things:

> It seems to me that it should not be a very difficult matter to arrange that each house, or group of two or three houses, should be provided with a small privy, constructed of boards, over a pit dug in the earth, and provided with steps and seats, and that the sanitarians should inspect these privies occasionally and see that they are kept in proper condition and removed from time to time to other pits when it shall appear necessary.

The commission thereon, at its meeting Feb. 4, 1905, adopted a report of its committee on sanitation, which was sent to the Isthmus for further comment by the governor of the canal zone and the chief sanitary officer.

Referring to this resolution, Governor Davis, under date of February 25, writes:

> It will be observed that Colonel Gorgas sees no necessity for any action by the commission in this matter, and I have not, myself, been able to think of any phase of the case that requires such action.
>
> Since my letter of January 17 the subject of the use along the canal line of privies and privy vaults for night soil, and before the receipt of the secretary's communication now at hand, was taken up by me with Colonel Gorgas and Mr Le Prince, and I personally made a sketch of a privy vault or pit that I thought would meet the case, and the instructions I gave to prevent the vault or pit from being flooded were almost exactly the same as those suggested in the memorandum of the committee on sanitation. . . . The commission will be kept advised as to the experience in this matter, and if any necessity arises for action by resolution or in a legislative way, the fact will be made known.

On the same subject, under date of February 24, chief sanitary officer, Col. W. O. Gorgas, writes:

> . . . In my opinion no special regulation by the commission is necessary for carrying out the views expressed in this resolution. . . . The scheme seems to me good and to fulfill the requirements. If on trial it is not found satisfactory, I shall report the circumstances to the proper authorities.

Dr. Reed tells you that the establishment of a convalescent hospital on the Island of Taboga with a physician and a head nurse was refused. Taboga is located about twelve miles down the bay of Panama, and the use of the island as a hospital will involve the keeping of a suitable steamer in service. It should be stated that the commission resolved, in August, 1904, as follows:

> The large two-story structure on Taboga Island, usually referred to as the "Convalescent Hospital," is suitable for a convalescent station to be made use of whenever the hospital facilities at Ancon prove inadequate. There is no immediate need of providing a medical staff for this station. It is estimated that $8,500 will be required to put the building in a suitable condition of repair.

This expenditure was authorized by resolution of Sept. 2, 1904, and the commission has, since that time, on recommendation of the chief sanitary officer, authorized the furnishing and use of this station by canal employes who need a change of air and of surroundings to recuperate their energies.

Another of the Doctor's misstatements relates to Miraflores Hospital. The establishment of this hospital was authorized immediately it was asked for. The transfer of personnel was authorized and no obstruction has been interposed by the commission to the filling of any vacancies created by such transfer.

You are told by Dr. Reed that the commission declined to give the chief sanitary officer some opportunity to exercise his judgment as to qualification of personnel and quality of material furnished his department. The present medical staff is of his own selection. He has been restricted only by civil service regulations. The method followed in purchasing medicines and supplies has already been explained.

You are told that the Health Department is hampered in its efforts to suppress yellow fever. In this connection it is only necessary to call attention to the fact that materials for use in disinfecting have been purchased as required, the following aggregate amounts of materials principally used purchased and forwarded:

14 tons of insect powder in 16 shipments.
52 tons of sulphur in 17 shipments.
2 tons of sulphate of iron.
23 tons of chlorid of lime.
500 pounds of sulphate of copper.

Regular shipments of insect powder and of roll sulphur are being made and will be continued until notice is received from the Sanitary Department that they are no longer needed.

The commission has at all times met every request for such material promptly. If some allowance be now made for misunderstandings as to what was required, and, on the other hand, for some duplication of purchases resulting from the use of the cable, it must be apparent that any difference in the amount of a single shipment from the amount named in the requisition should not be used as a reflection on the earnest effort of the commission to do effective sanitary work.

The following two letters from the chairman of the commission, one under date of Jan. 5, 1905, to General Davis, the other under date of Feb. 14, 1905, to Mr. E. C. Tobey, chief of Material and Supplies Department, will sufficiently illustrate the attention given to such matters.. The addresses and signatures being omitted, these letters are as follows:

SIR:—I this morning received your cable of yesterday as follows: Health Department will systematically fumigate Panama; require 2,000 pounds insect powder weekly for six weeks; present supply exhausted January 15. Can I depend on required shipments?

To which I replied:

Will send 2,000 pounds insect powder weekly.

In this connection I have to inform you that the steamer sailing yesterday took two orders of disinfecting material—one for eight (8) tons of rolled sulphur and one (1) ton of insect powder, and the other for 5,000 pounds of rolled sulphur and 4,000 pounds of insect powder.

The 2,000 pounds of insect powder which you request weekly for six successive weeks will be forwarded you beginning Tuesday, the 10th instant.

And the letter to Mr. Tobey:

DEAR SIR:—Referring to cable sent by General Davis, received at this office on the 5th day of January, 1905, requesting that six weekly shipments be made of insect powder in 2,000 pound lots:

I wish to bring to your attention that under this order the shipments would cease on the 14th day of February. To guard against possible chance that the supply should become exhausted, I have this day directed that two more consignments of 2,000 pounds each be made, bringing the total quantity up to 16,000 pounds, and to the 28th day of this month. On receipt of this letter, should the conditions warrant the continuing of these weekly shipments, you are directed to cable such request.

In further evidence of the earnest desire to facilitate the work of the Health Department in preventing and suppressing epidemics, the commission enacted the following in Act No. 8 of the Laws of the Canal Zone:

But in case of emergency created by threatened or imminent danger to the public health, extraordinary expenditures by the Board of Health may be authorized by the governor of the Canal Zone.

Under this authorization medical and sanitary supplies have been and can be purchased as required.

The commission, on Sept. 2, 1904, also passed the following resolution:

Resolved, That in case of any great public calamity, emergency or urgent necessity, the member or members of the commission on the Isthmus of Panama be, and they hereby are authorized to act for the commission, taking such measures as may be necessary to meet the conditions as they arise, and to purchase materials and to do any work or make any expenditures which they deem necessary to avert such calamity or to meet such emergency and urgent necessity.

You are told by Dr. Reed that the commission declared that screens for hospitals along the line of the canal were unnecessary. This is also a misstatement, the exact reverse being the case.

Building repairs are made under the direction and supervision of the chief engineer. The commission has not been advised that this arrangement is the cause of any embarrassment. The commission has not, as Dr. Reed desires that you should believe, required that estimates should first be submitted to the commission before repairs to buildings are made. The making of these repairs rests with the commission's representatives on the Isthmus.

The commission has not denied a request for a house at a quarantine station. Full authorization for all buildings asked for for the quarantine service has been given.

The commision maintains a laboratory at Ancon Hospital. Even if the commission were clear that the establishment of a laboratory for purely scientific research would be a proper feature of expenditure, it does not believe the time to have come for establishing one and denied a request for such laboratory. Dr. Herrick is the commission's pathologist at Ancon Hospital and he is the *x*-ray specialist and it is expected that at the Ancon Hospital laboratory for the present such scientific work as may be necessary will be done.

The keeping of the Ancon Hospital ambulance at the section stable instead of at a separate hospital stable is referred to by Dr. Reed as making it impossible to get the ambulance on ready call at times of an emergency. No arrangement for stabling the ambulance has been made which does not give the hospital officials complete control over its movements. It should be stated in this connection that the section stable is on a tract of land as fully under the control of the commission as the hospital site in contact therewith and less than 200 yards from the hospital buildings and connected by telephone. The combination of scattered stables into one establishment is a feature of efficient administration.

It is charged by Dr. Reed that the commission's hospitals are opened to all the world. No other answer seems necessary than a reference to the plan of organization and to the health regulations as set forth in the Laws of the Canal Zone (Acts Nos. 8 and 9). The medical staff should have power to order into hospitals all persons suspected of being ill with infectious or contagious diseases, and this has been given. The commission foresaw that restrictions would be necessary to prevent competition by the hospitals with physicians in private practice. The admission of patients as pay or charity patients is only permitted where the hospital authorities determine such admission to be desirable. It was not intended that any sick person not an employe of the commission should be admitted on mere application and, so far as the commission has been advised, no other construction has been placed on the paragraphs of the plan of organization relating to admission of patients.

To establish a proper relation between the commission's hospitals and their medical staffs on the one hand and the private physicians practicing on the Isthmus on the other, the commission will always be ready to take suitable action.

It has recently, on receipt of a suggestion relating to this matter, passed the following resolution, which was suggested by the chief sanitary officer:

Resolved, That any pay patient can employ any physician desired by such patient, and such physician can have access to such patient and use of all supplies and conveniences of the hospital, under regulations to be prescribed. A charge of not less than $5 and not more than $10 will be made for the use of operating room.

In case a pay patient in a hospital elects to have a physician employed by the commission to attend him or her, the superintendent shall charge for such attendance or surgical operation in accordance with the scale of fees, to be agreed on between the chief sanitary officer on the one hand, and the legally qualified medical men of Panama and Colon on the other.

This resolution was adopted at the request of Dr. Gorgas.

The commission is by no means certain that it will not soon require further modification, which will be made when asked for, but for the present accepts the view of Colonel Gorgas, who, under date of Dec. 6, 1904, referring thereto, says:

I have discussed this with a committee appointed to represent the physicians (referring to the medical profession of Panama), and they express themselves as being satisfied with the arrangements. This will give them access to the hospital and the advantages of the hospital, and they will make such arrangements as they please with their patients, just as if the patient were in a hotel.

In reference to the admission of all the world to the hospitals, it may be stated that the views of Colonel Gorgas were so extreme in August, 1904, that his original suggestion included the taking over and management, as already stated, of the hospitals and poorhouse of the Republic of Panama.

Dr. Reed is again in error when he says that it was "made a part of the Laws of the Canal Zone 'that surgical operations shall be charged for according to their importance and to the financial ability of the patient to pay, but no charges in excess of $50 shall be made without the approval of the director of hospitals.'" This is a quotation from page 166 of the minutes of the proceedings of the commission; it forms no part of the Laws of the Canal Zone. It has, as just stated, been already changed, based on the experience and recommendation of the medical staff.

The purpose of the requirement that a charge be made under certain circumstances for attendance on sick at their homes was to encourage the persons entitled to hospital treatment and to free medical treatment, to seek medical advice at the dispensaries and at the hospitals, thereby reducing the number of outside calls to be made by the commission's physicians. The charge for such attendance is in no sense, as Dr. Reed would have you believe, a charge in competition with private practitioners, or in compensation for the services rendered. He has quoted only enough to mislead, from the report on the plan of hospital organization. The full statement in that report relating to this matter as taken from the printed proceedings of the commission is as follows:

Visits made by physicians to the residence of any person entitled to free hospital treatment, or to the residence of a railroad employe, or to the residence of any other person entitled to treatment at the hospital at a fixed daily rate of pay, should be charged for at the rate of one-half dollar for each visit, but no such charge is to be made for emergency calls nor in the case of persons entitled to free hospital treatment until after the person has been ordered into a hospital.

It is true that the commission has declared that all money realized at hospitals from charges for board, medical attendance, surgical operations and the like, and from visits at residences, should be considered public funds. This is covered by the Laws of the Canal Zone in the following words:

All money collected for the United States by the Department of Health, or any of its several branches or services, or by any officer or employe thereof, shall be turned over to the government of the Canal Zone as soon as practicable after the date of its receipt.

Two of the members of the present commission have repeatedly visited the Isthmus in the last five years, and they know that the Isthmus during this entire time was never free from yellow fever. Why does Dr. Reed now venture such a statement referring to the last days of June, 1904, as the following: "Panama was then apparently free from yellow fever"?

Yellow fever being still epidemic in the city of Panama the commission has taken vigorous measures to stamp it out. It is considered of prime importance to exterminate the stegomyia mosquito in Panama. The commission at once recognized the importance of bringing into Panama a wholesome water supply and no time has been lost in selecting a source of supply and purchasing material. Only after water is thus made available can the use of water containers, the favorite breeding place of this particular mosquito, be prohibited.

In the meanwhile the commission appointed a health officer for the city of Panama, its Board of Health took charge of all suspected cases of yellow fever wherever found, and provision was made to have funds in any amount at its disposal in case of an emergency as already hereinbefore stated.

It is true that the treaty between the United States and Panama gives to the United States certain rights in the matter of prescribing and enforcing sanitary regulations in the cities of Panama and Colon. The following is from Article VI of the treaty:

The Republic of Panama agrees that the cities of Panama and Colon shall comply in perpetuity with sanitary ordinances, whether of a preventive or curative character prescribed by the United States, and in case the government of Panama is unable or fails in its duty to enforce this compliance by the cities of Panama and Colon, with the sanitary ordinances of the United States, the Republic of Panama grants to the United States the right and authority to enforce the same.

The commission gave its Health Department a temporary organization by formal action at its session of May 8, 1904. At this meeting "the chief sanitary officer and the director of hospitals, in addition to other duties, were designated as the Health Board for Colon and Panama," and the chief sanitary officer took such steps as he thought justified to improve the sanitary conditions in these cities. He asked for and was given certain powers in this matter by the government of the Republic of Panama and continued to exercise these until the scheme for a permanent organization of the Health Department took definite shape. About the same time the commission adopted sanitary rules and regulations for the cities of Panama and Colon and quarantine regulations for the ports and harbors of these cities.

At the commission's meeting of Sept. 2, 1904, the chairman was directed to transmit a copy of these rules and regulations to the proper authorities of the Republic of Panama with the request that such action be taken by competent authorities as might be necessary to give the rules and regulations the force of law. This was done and suitable action was subsequently taken by the government of Panama.

Not until January, 1905, was the commission advised by the authorities of Panama of its inability to properly enforce these regulations and the commission immediately took full charge of the work of cleaning and sanitation in Panama. In this matter the commission acted up to the entire limit of its authority as is shown by the following extract from a decision of the comptroller of the United States Treasury in which he says:

It requires no extended argument to demonstrate that until Panama confessed its inability or failed to execute these regulations the Government of the United States was not authorized so to do, and not being authorized to execute them could not legally, under such circumstances, pay for their execution.

It should be further stated in this connection that a health office for Panama, with a physician in charge, an assistant, two clerks and three inspectors are included in the Health Department organization, and were stationed there long before the United States took charge of the enforcement of health ordinances. A similar staff except the assistant health officer was provided in the plan of organization for Colon. Dr. Reed lays great stress on the subordination of the chief sanitary officer to the seventh degree, enumerating even the President and a single member of the commission to accomplish this subordination. In the discharge of his duties as a sanitary officer Dr. Gorgas has been absolutely free and has absolute freedom of action.

The providing of water for Panama received the attention of the commission in April, 1904, before the canal properties had passed into possession of the United States, it having been resolved on April 12 that parties be organized as soon as practicable for the doing of the following field work: " . . . Surveys for water supply and sewerage systems for Colon and Panama."

Under this resolution an engineer of experience was engaged and entered on his duties as soon as he could arrange his private affairs, on June 20, 1904. His duties included the design of water works for Panama, sewers for Panama, and water works and sewers for Colon.

The cleaning of the streets, including the disposal of night soil, was placed in the hands of Colonel Gorgas, with full powers, so far as the commission could confer them, on May 8, 1904.

Compare also this statement of Dr. Reed with the facts. He says, referring to the water works for Panama:

Mr. Wallace had drawn the plans and specifications in July previous and had taken care to specify only such pipe as manufacturers keep in stock, and that could, therefore, be procured without a moment's delay.

The facts are that the recommendation of the chief engineer that the selection of the Rio Grande as a source of water for Panama be approved, bears date August 6 (not July), and that the specifications for pipe submitted by him bear date of August 15, and were approved by the commission on August 19, as submitted.

The specifications as prepared had no reference to stock on hand by manufacturers. All delay in the delivery of this cast-iron pipe has been due to a default of the contractor in making shipment. The pipe was manufactured in time for shipment as required by contract, but the second (final) installment did not get off within the contract time.

The Doctor's ignorance as to the forms of water pipe and their method of manufacture has led him into a silly statement as to their details. The commission never asked the chief engineer for any explanation as to eastern or western patterns, as they exist only in the Doctor's imagination.

Every reasonable step is being and will be taken to reduce malaria. To this end an efficient sanitary corps for the canal zone has been organized and a vast amount of good work has been accomplished. Any one who knew the Isthmus before May 4, 1904, and who visits it now, can testify to the changed conditions. Ponds were drained and oiled, ditches constructed and cleaned out, and brush has been cut out, improving the surroundings of the several clusters of buildings in the canal zone.

The statement that the commission thought something like twenty laborers too many for the Health Department and allowed only one-half that number, is absolutely false. Laborers have been allowed as required and as necessary, and have been numbered by hundreds in the Health Department.

Dr. Reed says that a call for 2,500 yards of wire screening was cut by the commission to 500 yards. The commission has made four purchases of wire screen aggregating upwards of 17,000 square yards, besides entering into a $4,700 contract for screens suitably framed for door and window openings. None of the calls for screens was for the amount of 2[illegible] yards, as claimed by Dr. Reed.

No requisition for quinin was ever reduced or denied.

Dr. Reed is also in error when he states that the Isthmian Canal Commission, in its report of December, 1904, states:

> All cases of employes sick with malaria are taken to Colon and Ancon hospitals and so screened that mosquitoes can not reach them.

Dr. Reed calls this "an absolute and unqualified falsehood."

The words quoted by Dr. Reed are not those of the commission; they are not in the commission's report, but appear in a report of the governor of the canal zone, and probably have reference to the use of mosquito bars in the hospitals. Moreover, if mosquitoes are not kept from malarial patients at Colon and Ancon hospitals by the use of mosquito netting, the responsibility falls on the medical officers of these hospitals.

You are asked by Dr. Reed to consider the authorization by the commission, with the approval of its medical staff, to accept student nurses at Ancon Hospital as a mere subterfuge to secure cheap nursing.

The idea that a training school for nurses might prove a success was suggested by the application of a young woman of Panama, a member of one of the foremost families of that republic, who offered to render such service as she might, without pay, being desirous of having an opportunity to gain experience as a nurse, and by the statement made by herself and friends that other young women of Panama would probably avail themselves of any suitable opportunity to enter the hospital as student nurses. On this subject the report on a plan of organization says:

> Attention should also be called to the fact that young women, some from Panama, others from the United States, will be desirous of entering a hospital so well equipped as Ancon, as student nurses. This should be encouraged. Climate and environment are not unpleasant, and a good training school for nurses should prove attractive and would add materially to the hospital service.

The scheme as authorized would allow students compensation at the rate of $12 a month during the first year, $15 during the second and $18 during the third. The students would receive traveling expenses to the Isthmus from New York, New Orleans or San Francisco, and free return expenses to one of these cities in case of service for at least one year, or in case of disability by reason of illness.

The making of purchases of supplies and materials for use on the Isthmus has not been a simple problem. It has been and is the desire of the commission, so far as practicable, to make purchases on the basis of proposals submitted on advertisement. The following resolution relating to this matter was passed on Aug. 18, 1904:

> *Resolved*, That hereafter, so far as practicable, all purchases of machinery, material and supplies shall be made after due advertisement and competition.

On the other hand, it was necessary at the outset to send to the Isthmus such amounts of material and supplies as were required for the work of the commission, and to prevent loss of time and money to the government. Open market purchases were, therefore, necessary, but the making of open market purchases was stopped and restricted as soon as it seemed wise to do this.

In making purchases by advertising for proposals careful specifications had to take the place of the judgment of the purchasing agent and of experts, and the descriptions contained in requisitions had to be amplified before a call for proposals could be made. In other words, the requisitions were only a general evidence of their requirement; in many cases specifications had to be subsequently prepared. It has been the plan of the commission to have the needs of its several departments foreseen for half-year or full-year periods in order that purchases would be in sufficient quantities to avoid as far as possible emergency calls and to afford the purchasing officer ample time to prepare papers to call for proposals, with a reasonable time allowance to permit intending bidders in all parts of the country to prepare their proposals, and to permit of the delivery, or manufacture and delivery, as the case might be, of the articles required.

We quote in connection with the delivery of material to the Isthmus from the report of the subcommittee of the Committee on Interstate and Foreign Commerce of the House of Representatives:

> In fact, the supplies were received in such quantities and so much more rapidly than needed that the terminal facilities of the railroad were inadequate to care for them.

This, when read in connection with Dr. Reed's letter, may illustrate the difference which the standpoint makes from which the commission's affairs are discussed.

The commission, on its first visit to the Isthmus, in April, 1904, was accompanied by the three chief members of the sanitary corps of the canal. They returned together and were in conference in Washington concerning the preliminary organization of the Health Department for the zone. The views and propositions presented by the chief and associate sanitary officers were then discussed and, with slight modification, accepted by the commission. These officers returned to the Isthmus in June, with full authority to inaugurate their work by selecting their personnel and providing their supplies.

The commission returned to the canal zone early in August, when the necessity of immediate and permanent sanitary organization was at once apparent. A great part of the five weeks during which the commission remained there was spent in conference with the heads of the Health Department, after their experience of three months, concerning the scope and details of an organization which should give them all necessary authority and opportunity to perform their most important duty. The discussion was full and free and resulted in the adoption of the project, which forms part of the minutes of the commission for Aug. 28, 1904. It was the clear understanding at the time, and has been since, that this scheme of organization was satisfactory, not only to the commission, but to the officers on whom the responsibility for the sanitation of the Isthmus devolved. Since that time much correspondence on sanitary subjects has passed and many interviews with members of the sanitary staff have been held, but the commission has not learned from either source that the plan of organization has failed or has become unacceptable to those charged with its execution. Notably, a committee of the commission, recently returned from the Isthmus, unre-

servedly states the full satisfaction of the sanitary staff with the successful operation of the organization and the health conditions on the Isthmus.

Of course, during the inception of this great work, there have been occasions when the filling of requisitions has been delayed, or where other annoyances have temporarily existed, but the commission has no reason to believe that the scheme of sanitary administration has not been wisely devised, or that it has not been effective in operation.

The commission understands the immense importance of the sanitation of the Isthmus as a factor in the building of the canal. It is certain that the chiefs of the Sanitary Department be aware of the grave responsibility resting on them. If the statements of Dr. Reed were true, either in detail or in the general impression they are intended to convey of sanitary conditions on the Isthmus, they would convict the sanitary staff of a gross abandonment of duty in failure to inform the commission therof. Neither from official conferences nor from correspondence, nor from interviews with members of the staff, has it been learned that the plan is defective in scope or in elasticity, or that troubles have occurred except such as inevitably attend the organization of great enterprises.

It remains to be stated that the action of the commission as expressed in its reports and in the resolutions found in the record of its proceedings, is to be accepted as the action of the commission, and represents a consensus of opinion often arrived at before a report or a resolution was written. The fact that any commissioner may have been more frequently noted than others as presenting resolutions is no reason why greater responsibility for the commission's action should fall on him than on the other commissioners.

In conclusion the commission desires to express its appreciation of the courtesy of your act in giving it early opportunity to file a reply to the letter of Dr. Reed.

The report of Dr. Reed was transmitted to this commission by you as a confidential document. The commission has learned, however, that within the last few days it has appeared in full in THE JOURNAL A. M. A., published in Chicago, and that synopses thereof have been published in a number of newspapers. The commission would, therefore, most respectfully suggest that this reply be not treated as a confidential document, but that a copy thereof be transmitted with a request for publication in full to THE JOURNAL A. M. A., and that the public press be requested to give it extended notice.

Very respectfully,

J. E. WALKER.
W. H. BURR.
B. M. HARROD.
C. E. GRUNSKY.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS will not be noticed. Queries for this column must be accompanied by the writer's name and address, but the request of the writer not to publish his name will be faithfully observed.

NEWSPAPER ADVERTISEMENTS—ABORTION AND PREVENTION OF CONCEPTION.

ELMHURST, ILL., March 16, 1905.

To the Editor:—I wish to speak of a phase of our social system which has long stigmatized our honorable calling and has ruthlessly been reaping its harvest of innocents unmolested and unhampered by law or press. The owners of our daily and Sunday papers are being subsidized to pollute their pages with the most vicious and degrading advertisements. The editors will prate about virtue and write voluminously about corrupt civic and federal legislation, but their virtue is confined solely to the editorial page, and under the plea of not being argus-eyed they fail to see what vile stuff their advertising columns contain. In one Chicago paper these corrupting advertisements are not confined to the advertising pages, but are promiscuously scattered through the reading matter in bold type so as to be observed by the most casual reader. One would infer from the bold manner in which these medical lepers announce their murderous trade to the public, that trafficking in human life is a legitimate and lawful procedure. This scum of the medical profession, among whose wares honor and virtue are absent, for the paltry sum of two or three dollars, will commit the most heinous offense to which a physician can lower himself. Either the statutes are not sufficiently rigid and far-reaching, or public officials are derelict in their duty. We as physicians can not allow this nefarious practice to continue, and retain our self-respect at the same time. The correction of this murderous practice devolves on the medical profession for the following reasons: 1. Since some of its integers are *particeps criminis* in the social sin, and 2, as conservators of the public health. It does not require acute reasoning or a wide stretch of the imagination to discern that a high percentage birth rate and the continuance of this evil are incompatible. When, in plain language, appliances for the prevention of conception are heralded in one column of the press, and methods for the destruction of the ovum in an adjoining column, it is very evident that the prospect of a high birth rate is not very flattering. The medical profession should accept the responsibility and duty of acting as censor, so that our newspapers are so cleansed of these filthy and criminal advertisements that the pure and innocent may read every column without danger of defilement. If our efforts are directed against this evil we will not only relieve the medical profession of an incubus but will destroy the parasites that are attacking the roots of our nation's growth and prosperity.

HENRY F. LANGHORST.

EVANSTON, ILL., March 20, 1905.

To the Editor:—What is the law in Illinois regulating the use of pessaries? Is it legal to use the so-called pessary, etc., with the sole object of preventing conception? G. A. W.

ANSWER:—We are unable to find any law in existence in Illinois on the use of pessaries to prevent conception. The United States postal regulations debar from the mails any matter that conveys or advertises any means, device, etc., for the prevention of conception or for the procuring of abortion. There is a law in Illinois entitled:

"An Act to Prevent the Sale of Drugs or Medicines designed to Procure Criminal Abortion."

As there are doubtless many who are unfamiliar with it, we quote it below:

"Section 1. Be it enacted by the People of the State of Illinois, represented in the General Assembly, That no druggist, dealer in medicines, or any other person in this state, shall sell to any person or persons any drug or medicine known or presumed to be ecbolic or abortifacient, except on the written prescription of some well-known and respectable practicing physician. And any druggist or dealer in medicines filling such prescription shall, in a book especially provided for that purpose, correctly register the name of the physician prescribing, the person to whom sold, the name of the medicine or medicines, and the amount, together with the date of the sale.

"Section 2. No druggist, dealer in medicine, or any other person, shall keep on hand or in any manner advertise or expose for sale, or sell, any pills, powders, drugs or combination of drugs, designed expressly for the use of females, in any other manner or form than that hereinafter described, to-wit: The proprietor of any such pill, powder, drug or combination of drugs, shall submit, under oath, a true statement of the formula by which the same is compounded, to five well-known and respectable practicing physicians in the county where the same is proposed to be sold; if the said physicians unanimously agree that the proposed formula is not of an abortifacient character, they shall issue their certificate, under oath, to that effect, a copy of which shall be kept, with the formula attached, for the inspection of any person desiring to see the same, by the druggist or dealer in medicine proposing or desiring to keep for sale such medicine—and this shall be his full warrant for such sale: Provided, this section shall not be taken or construed to apply to such compounds as are known as 'officinal.'

"Section 3. Any person or persons violating any of the provisions of this act shall, on conviction thereof, be punished by a fine of not less than fifty nor more than five hundred dollars or by imprisonment in the county jail not less than thirty days or more than six months, for each and every offense, or by both."

This law went into effect July 1, 1872, and is still on the statute book.

TEXT-BOOK ON NURSING.

LEWISTON, IDAHO, March 21, 1905.

To the Editor:—Please let me know what you consider the latest and best text-book on nursing; also where it can be had and price.

T. J. COSTELLO, M.D.

ANSWER:—For hospitals and training schools, the two books in general use are "A Text-Book of Nursing," by Clara Weeks-Shaw ($1.75), and "Nursing," by Isabel Hampton ($2). In a hospital other books on special branches are used, chief among these being "Obstetrics for Nurses," by De Lee; "Anatomy and Physiology for Nurses," by Diana Kimber, and "Materia Medica for Nurses," by Emily Stoney. A good book for nurses in private work is "Practical Points in Nursing," by Emily Stoney. Any or all of these books may be obtained from W. T. Keener & Co., Chicago, or from any firm dealing in medical books.

State Boards of Registration

COMING EXAMINATIONS.

Idaho State Board of Medical Examiners, Boise, April 3. Secretary, Robert L. Nourse, M.D., Hailey.

Utah State Board of Medical Examiners, Salt Lake City, April 3. Secretary, R. W. Fisher, M.D., Salt Lake City.

Central District Board of Medical Examiners for the Indian Territory, South McAlester, April 3. Secretary, B. W. Caldwell, M. D., Hugo.

Board of Medical Examiners of Arizona, Phoenix, April 3-4. Secretary, Ancil Martin, M.D., Phoenix.

Missouri State Board of Health, University Medical College, Kansas City, April 3-5. Secretary, Winn F. Morrow, M.D., Kansas City.

Board of Medical Examiners of Montana, Helena, April 4. Secretary, Wm. C. Riddell, M.D., Helena.

Board of Medical Examiners of the State of California, San Francisco, April 4. Secretary, Charles L. Tisdale, M.D., San Francisco.

Regular Board of Medical Examiners of Georgia, Atlanta, April 4. Secretary, F. D. Patterson, M.D., Cuthbert.

State Board of Medical Examiners of Tennessee, Nashville, Memphis and Knoxville, April 4-5. Secretary, T. J. Happel, Trenton.

Minnesota State Board of Medical Examiners, the Old State Capitol Bldg., St. Paul, April 4-6. Secretary, C. J. Ringnell, M.D., Minneapolis.

Rhode Island State Board of Health, State House, Providence, April 6-7. Secretary, Gardner T. Swarts, M.D., State House, Providence.

State Medical Board of the Arkansas Medical Society, Little Rock, April 11. Secretary, J. P. Runyan, M.D., Little Rock.

State Board of Health of West Virginia, Parkersburg, April 11-13. Secretary, H. A. Barbee, M.D., Point Pleasant.

Board of Medical Examiners of Oregon, Portland, April 11-13. Secretary, Byron E. Miller, M.D., The Dekum, Portland.

Illinois State Board of Health, Great Northern Hotel, Chicago, April 12. Secretary, J. A. Egan, M.D., Springfield.

Board of Medical Supervisors of the District of Columbia, Washington, April 13. Secretary, Wm. C. Woodward, M.D., Washington.

Kansas State Board of Medical Registration and Examination, Kansas City, April 25-26. Secretary, G. F. Johnston, M.D., Lakin.

Board of Medical Examiners for the State of Texas, Austin, May 2. Secretary, M. M. Smith, M.D., Austin.

Indiana State Board of Medical Registration, State House, Indianapolis, May 2-4. Secretary, W. T. Gott, M.D., Crawfordsville.

Louisiana State Board of Medical Examiners, New Orleans, May 4-5. Secretary, Felix A. Larue, M.D., New Orleans.

Mississippi State Board of Health, Jackson, May 9-10. Secretary, J. F. Hunter, M.D., Jackson.

New York State Homeopathic and Eclectic Boards, New York, Albany, Syracuse and Buffalo, May 16-19. Chief of Examinations Division, Charles F. Wheelock, State Capitol, Albany.

Kansas February Report.—Dr. C. F. Johnston, secretary of the Kansas State Board of Medical Registration and Examination, reports the written examination held at Topeka, Feb. 14-15, 1905. The number of subjects examined in was 12; total number of questions asked, 100; percentage required to pass, 75. The total number of persons examined was 24, of whom 21 passed and 3 failed. The following colleges were represented:

College.	Year Grad.	Per Cent.
PASSED.		
University of Kentucky	(1904)	83
Ensworth Med. College	(1904)	79
Kentucky School of Medicine	(1898)	80
Eclectic Med. Inst., Cincinnati	(1900) 77; (1903)	86
University Med. Coll., Kansas City (1893) 82; (1901) 87; (1903) 79; (1904) 80, 82.		
University of Pennsylvania	(1902)	86
Rush Med. College	(1893)	83
Chicago Homeo. Med. Coll	(1903) 75; (1904)	82
Hahnemann Med. College	(1901)	86
University of Colorado	(1895)	88
College of P. & S., Keokuk	(1895)	85
Louisville Medical College	(1904)	81
Northwestern University	(1900)	86
University of Virginia	(1894)	85
Barnes Med. College, St. Louis	(1892)	82
FAILED.		
University Med. College, Kansas City	(1904)	73
Ohio Med. College, Cincinnati	(1880)	72
Physio-Medical College, Indianapolis	(1890)	62

The Public Service

Navy Changes.

Changes in the medical corps, U. S. Navy, for the week ending March 25, 1905:

Dickinson, D., medical director, detached from the Naval Hospital, Chelsea, Mass., and ordered to the Navy Yard, Portsmouth, N. H., and to additional duty in command of the Naval Hospital at that place, April 3.

Wells, H., medical director, detached from the Naval Hospital, Newport, R. I., and ordered to duty in command of the Naval Hospital, Chelsea, Mass.

Farwell, W. G., medical director, detached from the Naval Hospital, Portsmouth, N. H., April 5, and ordered home.

Dickson, S. H., medical inspector, detached from the *Kearsarge* and ordered to the *Maine*.

Heneberger, L. G., medical inspector, ordered to duty in command of the Naval Hospital, Newport, R. I., April 3.

Grow, E. J., Grunwell, A. G., Langhorne, C. D., surgeons, commissioned surgeons, with the rank of lieutenant commander, from March 3, 1903.

Johnson, M. K., surgeon, detached from the *Tacoma* and ordered to the *Maine*.

Kite, I. W., surgeon, detached from the *Maine* and ordered to the *Kearsarge*.

Snyder, J. J., P. A. surgeon, detached from the *Kearsarge* and ordered to the *Tacoma*.

Shiffert, H. O., P. A. surgeon, commissioned P. A. surgeon, with rank of lieutenant, from Dec. 26, 1903.

Stuart, Allan, P. A. surgeon commissioned P. A. surgeon, with rank of lieutenant, from June 7, 1904.

Bishop, L. W., P. A. surgeon, commissioned P. A. surgeon, with rank of lieutenant, from Sept. 28, 1904.

Tolfree, H. M., asst.-surgeon, detached from the *Hancock*, April 13, and ordered to Washington, D. C., for examination for promotion, and then to wait orders.

Bogert, E. S., detached from the Naval Academy, March 25, and ordered to the *West Virginia*.

Drake, N. H., medical director, detached from the *Hancock* and ordered to the Navy Yard, Norfolk, Va.

Lumsden, G. P., surgeon, detached from the Navy Yard, Norfolk, Va., and ordered to the *Minneapolis*.

Crandall, R. P., surgeon, ordered to the *Hancock*.

Winn, C. K., acting asst.-surgeon, detached from the Naval Hospital, Norfolk, Va., and ordered to the *Cæsar*.

Janney, W. H., acting asst.-surgeon, detached from the *Cæsar*, and resignation accepted, to take effect March 22.

Blackwell, E. M., P. A., surgeon, detached from the *Castine* and ordered to the Naval Station, San Juan, P. R.

Butler, C. S., P. A. surgeon, detached from the Naval Station, San Juan, P. R., and ordered to the *Castine*.

Shook, F. M., asst.-surgeon, appointed asst.-surgeon, with rank of lieutenant, J. G., from March 15, 1905.

The following asst.-surgeons were detached from duty at the Naval Museum of Hygiene and Medical School, Washington, D. C., and ordered to duty as follows: R. B. Chapman, Naval Hospital, Mare Island, Cal.; H. F. Hull, U. S. R. S. *Franklin*; G. L. Wickes, U. S. R. S. *Lancaster*; W. J. Zalesky, Naval Academy; H. T. Nelson, Naval Hospital, Washington, D. C.; C. T. Grayson, Marine Barracks, Washington, D. C.; W. N. McDonell, Naval Station, P. R., and additional duty on the *Alliance*. E. A. Vickery, Navy Yard, Portsmouth, N. H., and additional duty on the *Southery*; R. E. Stoops, *Pensacola*, and additional duty at Naval Training Station, San Francisco, Cal.; R. G. Heiner, Navy Yard, Washington, D. C.; H. A. May, U. S. R. S. *Franklin*; J. L. Belknap, Naval Hospital, Narragansett Bay, R. I.; L. H. Wheeler, Naval Hospital, Narragansett Bay, R. I.; W. D. Owens, Naval Hospital, Mare Island, Cal.; W. A. Angwin, Naval Academy; O. J. Mink, Naval Hospital, New York, N. Y.; N. T. McLean, Naval Hospital, Chelsea, Mass.; W. G. Farwell, Naval Hospital, New York, N. Y.; H. W. Cole, Jr., and C. E. Strite, Naval Hospital, Norfolk, Va.

Acting Asst.-Surgeon F. E. Sellers, detached from the Naval Station, Culebra, and ordered home to wait orders. Acting Asst.-Surgeon V. Dabney, detached from Rec. Party No. 2, and ordered to the *Colgoa*; A. A. Surgeon T. C. Blackburn, detached from the *Colgoa* and ordered to Rec. Party No. 2, at Dallas, Texas.

Public Health and Marine-Hospital Service.

List of changes of station and duties of commissioned and non-commissioned officers of the Public Health and Marine-Hospital Service for the seven days ending March 22, 1905.

Glennan, A. H., asst.-surgeon general, granted an extension of leave of absence for three days from March 21.

Sawtelle, H. W., surgeon, granted leave of absence for two days from March 17.

Mathewson, H. S., P. A. surgeon, bureau letter of March 11, granting leave of absence for five days from March 13, amended to read six days from March 13.

Fricks, L. D., P. A. surgeon, relieved from duty at the Immigration Depot, New York, and directed to proceed to Castries, St. Lucia, W. I., for duty in the office of the American consular agent.

Kerr, J. W., P. A. surgeon, granted leave of absence for five days from March 14, 1905, under Paragraph 191 of the Regulations.

Wilson, R. L., P. A. surgeon, to proceed to Vera Cruz, Mexico, for duty in the office of the American consul.

McLaughlin, A. J., asst.-surgeon, granted leave of absence for six days from March 20.

Frick, John, acting asst.-surgeon, relieved from duty at Laredo, Texas, and directed to proceed to Tampico, Mexico, for duty in office of American consul.

Goldsborough, B. W., acting asst.-surgeon, granted leave of absence for three days from March 23.

Kurtz, W. M., acting asst.-surgeon, granted leave of absence for seven days from March 18, 1905, under Paragraph 210 of the Regulations.

McLarty, A. A., acting asst.-surgeon, granted leave of absence for 30 days from April 1.

BOARD CONVENED.

Board to meet at Washington, D. C., March 18, 1905, for the

physical examination of an officer of the Revenue-Cutter Service. Detail for the board; Asst.-Surgeon-General W. J. Pettus, chairman; Asst.-Surgeon-General H. D. Geddings; Asst.-Surgeon A. J. McLaughlin, recorded.

Health Reports.

The following cases of smallpox, yellow fever, cholera, and plague have been reported to the Surgeon General, Public Health and Marine-Hospital Service, during the week ended March 24, 1905.

SMALLPOX—UNITED STATES.

District of Columbia: Washington, March 11-18, 1 case, 1 death.
Florida: Jacksonville, March 11-18, 3 cases.
Illinois: Chicago, March 11-18, 20 cases, 3 deaths.
Kentucky: Lexington, March 11-18, 1 case; Louisville, March 8-16, 4 cases.
Louisiana: New Orleans, March 11-18, 11 cases.
Michigan: At 65 places, Feb. 25-March 4, present.
Missouri: St. Louis, March 11-18, 43 cases, 2 deaths.
Nebraska: Omaha, March 11-18, 2 cases.
New York: Mount Vernon, March 11-18, 1 case; New York City, 1 case.
Ohio: Toledo, March 4-18, 9 cases.
Tennessee: Memphis, March 11-18, 10 cases.

SMALLPOX—FOREIGN.

Argentina: Buenos Ayres, Dec. 1-31, 17 deaths.
Brazil: Nictheroy, July 1-Jan. 1, 248 deaths; Santos, Jan. 15-22, 1 death.
Ecuador: Guayaquil, Feb. 1-28, 3 deaths.
France: Paris, Feb. 25-March 4, 22 cases, 1 death.
Germany: Bremen, Feb. 18-25, 2 cases.
Great Britain: Bradford, Feb. 18-25, 5 cases, 1 death; Leeds, Feb. 25-March 4, 1 case, 1 death; Leith, 2 cases; London, Feb. 18-March 4, 11 cases; New Castle-on-Tyne, Feb. 25-March 4, 3 cases.
India: Bombay, Feb. 14-21, 164 deaths; Calcutta, Feb. 11-18, 3 deaths; Karachi, Feb. 12-19, 3 deaths; Madras, Feb. 11-17, 1 death.
Italy: Lecce Province, Jan. 16-23, 6 cases.
Russia: Moscow, Feb. 18-25, 8 cases, 1 death.
Spain: Barcelona, Feb. 21-28, 5 deaths.
Uruguay: Montevideo, Feb. 16, 34 cases, 7 deaths.

YELLOW FEVER.

Panama: Panama, Jan. 1-March 7, 36 cases, 14 deaths.

CHOLERA.

India: Calcutta, Feb. 11-18, 24 deaths.
Turkey in Asia (general): Jan. 14-21, 40 cases, 12 deaths; Van, Jan. 14-21, 34 cases, 7 deaths.

PLAGUE.

Africa (British): Kismu, Jan. 5-12, present.
Arabia: Aden, Feb. 11-18, 374 cases, 342 deaths.
Chile: Chanaral, March 16, present; Iquique, present; Pisaqua, epidemic.
Egypt: Suez, Feb. 2-9, 4 cases, 1 death; Tukh, Feb. 4, 1 case.
India: Bombay, Feb. 14-21, 666 deaths; Calcutta, Feb. 11-18, 88 deaths; Karachi, Feb. 12-19, 59 cases, 58 deaths; Madras, Feb. 11-17, 1 death.
Russia: Uriask Territory, Nov. 1, 1904-Jan. 16, 343 deaths.

Society Proceedings

COMING MEETINGS.

AMERICAN MEDICAL ASSOCIATION, Portland, Ore., July 11-14, 1905.

Medical Association of the District of Columbia, Washington, April 4.
Association of American Medical Colleges, Chicago, April 10.
Tennessee State Medical Association, Nashville, April 11.
South Carolina Medical Association, Greenville, April 12.
Medical Association of the State of Alabama, Montgomery, April 18.
Medical Society of the State of California, Riverside, April 18-20.
American Medico-Psychological Association, San Antonio, Texas, April 18-21.
Florida Medical Association, Jacksonville, April 19.
Medical Association of Georgia, Atlanta, April 19.
Mississippi State Medical Association, Jackson, April 19.
American Association of Pathologists and Bacteriologists, Chicago, April 21-22.
American Gastro-Enterological Association, New York, April 24-25.
Medical and Chirurgical Faculty of Maryland, Baltimore, April 25-27.
Texas State Medical Association, Houston, April 25-28.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Regular Meeting, held March 8, 1905.

Dr. Howard M. Fussell in the Chair.

Fracture of Cervical Spine.

DR. CHARLES W. BURR exhibited a case of fracture of the cervical spine. The patient fell from a cart striking his neck and shoulders. After regaining consciousness he had severe pain in the neck, shoulders and both arms, and loss of power in the arms. About six months later he could walk fairly well, with short, stiff steps. He held his neck stiffly; movements in the arms were limited by rigidity and by weakness. The grip was very weak. The deep reflexes were increased. The skiagraph revealed a fracture of the body and lamina of the fifth cervical vertebra. At the present time he walks well. His head is held stiffly. He can move it a little, but with pain. There is considerable movement of the arms, with rigidity. The kneejerks are a little increased. The plantar jerks are normal. There is a little muscular wasting in the deltoids, but none elsewhere. There is some spasmodic retention of urine.

DISCUSSION.

DR. M. K. KASSABIAN showed that a very small per cent. of fractures are of the spine. In 1,500 cases of fracture only 4 per cent. were of the spine.

DR. MORRIS B. MILLER stated that operation should only be undertaken when there is pressure on the cord or from bone. Ankylosis gives a fair chance of slow absorption of hemorrhage and gradual restoration of function. To secure that no device is better than a modified jurymast.

How Can the Physician Profit by Preventive Medicine?

DR. J. MADISON TAYLOR presented evidence to show that it is necessary that preventive medicine shall be exhibited to the profession as a means of advantage to themselves as well as to the community. The relationship of the physician to the patient is on the wrong basis. The practitioner should be given free opportunty to inspect the members of a household at regular periods or at will, and not called only when there is illness. Disease is now being studied from the standpoint of economics, hence prevention is to be welcomed as a source of general wealth. Legislation can be made more effective if physicians will do their part toward the prevention or limitation of preventable disease. Physicians should more clearly point out the ways to reform and educate the public, and they should accept the authority of the health boards more cordially and work with them to accomplish results. He recommended the adoption of a different fee system, and said that it is a false position for the physician to earn no fee except by being invited to meet exigencies; better, he says, to adopt the plan long since found necessary by lawyers, of demanding a retaining fee or yearly stipend of the householder, thus giving them access to the house to rectify constitutional peculiarities and save from peril. He alluded to the neglected duty of the physician of discouraging the use of many medicines, bitters, tonics, cough medicines and the like, whose chief attractiveness is the contained alcohol or narcotics.

Osmic Acid Treatment of Tic Douloureux.

DR. W. WAYNE BABCOCK reported a severe case of trifacial neuralgia. The condition had persisted for thirty-five years, despite eight operations, including two attempts to remove the Gasserian ganglion, and the excessive use of drugs had at one time led to temporary insanity. About nine months ago a 2 per cent. solution of osmic acid had been injected under cocain anesthesia, into the inferior dental nerves. More recently the infraorbital, palatine and supraorbital nerves were injected. The patient has gained thirty-five pounds in weight and his physicial condition is improved. No major operation, he stated, is warranted in the treatment of trifacial neuralgia until the futility of osmic acid injections into the peripheral nerve trunks has been proved.

DR. L. J. HAMMOND called attention to the relations of the nerve fibers comprising the trifacial, and thought that absolute cure of these pains should not be expected until not only the trifacial, but the different branches of the fifth nerve were dealt with.

The Problem of the Treatment of Laryngeal Tuberculosis.

DR. W. G. B. HARLAND stated that the vocal cords, interarytenoid fold and arytenoids are the parts most often affected, involvement of epiglottis or epiglottic folds being more serious. Most forms of the disease pursue a harmless chronic course. Edema and deep ulceration, however, are dangerous. The laryngeal lesion does little harm, except when it causes

dyspnea, pain or difficulty in swallowing; it forms an index of general health and resisting power. Treatment is directed toward lessening irritation in the upper air tract, healing ulcerations and building up general health. The *x*-ray is of use in some cases. Serum therapy promises much.

DISCUSSION.

DR. W. WAYNE BABCOCK referred to a case of laryngeal tuberculosis, in which, following an intralaryngeal application, the patient had dyspnea and became unconscious. A rapid tracheotomy was done, after which she improved and gained in weight. Further applications were not made by the laryngologist for fear of the edema, but after two or three months the edema again developed. A second tracheotomy was done, and since that time the patient has worn a tube continuously. Her voice is better and she has gained in weight.

DR. L. J. HAMMOND has operated on eight cases of laryngeal phthisis with good results. The best treatment is to put the parts at rest.

DR. GEORGE E. PFAHLER mentioned a case in which he is making the *x*-ray applications externally, using a high vacuum tube at a distance of from 15 to 20 inches. Distinct improvement has been noted.

DR. HARLAND said he had observed that the surgical treatment is rather unsatisfactory.

NORTHWEST MEDICAL SOCIETY OF PHILADELPHIA.

Regular Meeting, held Jan. 24, 1905.

The President, Dr. Hugh Hanna, in the Chair.

Cancer of Corpus Uteri.

DR. FRANK C. HAMMOND reported three cases and reviewed the symptoms and diagnosis of this affection. He emphasized the fact that if success is to be obtained in the treatment the practitioner must recognize the importance of early diagnosis and early radical operative procedures. When the cervis uteri is normal and the patient presents symptoms suggestive of malignancy of the uterus, one must not lose sight of the fact that malignancy of the body of the uterus may be present. Emphasis was laid on the necessity of curetting all cases of suspicious bleeding and submitting the scrapings to a careful microscopic examination. This is supported by the fact that the prognosis in adenocarcinoma of the corpus uteri is generally favorable, provided that the process is detected in the early or comparatively early stages. Should no microscopic evidence of cancer be found, the curettage must be repeated whenever the bleeding reappears. The reappearance of hemorrhage, one, two, three or more years after the menopause, is strong presumptive evidence of cancer and always demands immediate examination. Too often the four cardinal symptoms, pain, hemorrhage, fetid discharge and cachexia are most depended on for diagnosis, and by the time these symptoms are present, too frequently the case is inoperable. For making an intrauterine digital examination the uterus is best dilated by means of the Schatz metreurynter; in multiparous women the dilation is painless, but in the nulliparous it is more or less painful. Early complete hysterectomy is the only means of treatment.

DISCUSSION.

DR. J. THOMPSON SCHELL considered the diagnosis of these conditions very difficult and referred to the case of a woman 45 years of age, giving a history of having missed three periods and then going through with what seemed to be an incomplete abortion. A curettement was done, but the scrapings were not examined. The same history was repeated at the expiration of eight or nine months and seven months, respectively. The report on the scrapings showed them to be normal deciduous tissue, but it was finally decided to remove the uterus. Examination of the tumor showed it to be a very small adenocarcinoma. He expressed the belief that cases of this character may run a course of a number of years, apparently becoming normal after each curettement, and then giving a history of abortion, as in this case. The patient above referred to made a good recovery. Another case was that of a woman who gave a history of repeated hemorrhages, occasionally between the periods, the discharge being odorless. Curettement and examination of the scrapings showed it to be a beginning carcinoma, which was removed, and the woman made a good recovery. He urged the importance of early diagnosis and operation, and emphasized the value of the Schatz metreurynter.

DR. WILMER KRUSEN stated that only about 5 per cent. of all cases of cancer of the uterus are cancer of the body. There is very little clinically to aid in the diagnosis. He referred to the rarity of this condition in the colored race and nulliparous women, and stated that Emmett reported only one case. While text-books class this as a disease occurring between 40 and 50, probably in about four-fifths of the cases it occurs in women under 32. The only symptoms present in these cases early is a little bleeding, and the uterus little or not at all enlarged. He, too, emphasized the value of the Schatz metreurynter as a diagnostic aid, but believed the application thereof produced considerable pain. The prognosis is more favorable in cases of cancer of the body than in cervical cancer.

DR. FRANK C. HAMMOND, in closing, stated that the younger the woman the more rapid was the fatal termination of the disease when operation was refused, and referred to cases reported by Kelly in which malignant disease had been diagnosed as long as five years before death.

Extrauterine Pregnancy.

DR. WILMER KRUSEN referred to the fact that the condition was being more frequently recognized at present than in the past, and attributed this to advances in abdominal surgery. As causes of the condition he mentioned: (1) Mechanical causes which interfere with the downward passage of the ovum; (2) causes resulting from inflammatory conditions of the tubes, ovaries and pelvic peritoneum; (3) physical and developmental abnormalities which favor decidual formation in the tubes. He reported a case of the second type. The patient, 30 years of age, had a negative family history, except that her mother died of heart disease at 45. She had had measles, varioloid and appendicitis, said to have been complicated by peritonitis, five years ago. Three years after marriage her first child was born, a "blue baby." Two weeks after confinement, the patient complained of intense pain in the lower abdominal region extending to the inguinal region, before the appearance of which there was a movable mass noticeable in the hypogastric region, which disappeared on the appearance of the former. Following these symptoms there was a very marked odor to the vaginal discharge, which after about six weeks disappeared, and a few weeks later the patient felt perfectly well. In May, 1904, the patient complained of soreness when standing, which was diagnosed as a case of enlarged tubes, and treated with tampons, but with no avail. Menstruation continued almost normal up to November 6, when she menstruated but one day, and between that date and November 27, when brought into the hospital, the patient felt well and gained flesh. One evening, on retiring, she complained of pain in the lower abdomen, which increased and extended up to the diaphragm. Vomiting began shortly afterward. At noon there was dyspnea, interference with sight and hearing and weakness. Operation revealed the left tube as the site of the rupture; on the right side was a tubo-ovarian abscess. Both appendages were removed, the patient making an uninterrupted recovery.

DISCUSSION.

DR. FRANK C. HAMMOND stated that the opening in the tube was very very small, as though some person had taken a pencil point and pierced it.

DR. J. THOMPSON SCHELL referred to a case in which he had done two curettements, the woman having a history of about fourteen self-produced abortions, usually at about the end of the third month of pregnancy. He was called in to see her when she had symptoms of beginning peritonitis and obstruction of the bowel, having had no movement for two days. On opening the abdomen a gangrenous right fallopian tube and a fetus were found, and on the other side an abscess cavity,

about as large as a canteloupe. Drainage was established through the vagina, but the patient died of pelvic peritonitis.

DR. CARLE LEE FELT referred to a case in which, after childbirth, the patient thought she had a tumor. At the operation ectopic gestation was found, which had been present during her pregnancy.

DR. M. J. KARPELES referred to three cases of ectopic gestation. The first case was diagnosed as typhoid fever. Examination revealed the presence of a mass behind the uterus. The second patient had a history of nocturnal paroxysmal abdominal pain, discharge of blood, and miscarriage six months before. Another miscarriage was suspected, a curettement done, and she apparently improved for a few days, when the fever increased. A mass was felt in the right side, operation was done and the patient made a good recovery. The third patient gave a history of slight bloody discharge. Miscarriage was suspected, but proved to be an ectopic gestation.

DR. KRUSEN stated that he usually gave 1/60 of a grain of salicylate of eserin, every three or four hours, until the bowels were moved.

CHICAGO UROLOGICAL AND CHICAGO MEDICAL SOCIETIES.

Joint Meeting, held March 1, 1905.

The President of the Chicago Urological Society, Dr. R. R. Campbell, in the Chair.

Pus Infections of the Genital Tract in the Male.

DR. WILLIAM T. BELFIELD read a paper on this subject which will appear in THE JOURNAL.

X-Rays as a Means of Diagnosis in Kidney Surgery.

DR. ARTHUR DEAN BEVAN called attention to the fact that the first work done in this country in this line was done in Chicago in 1897. Since that time very definite results have been obtained by the use of the *x*-ray. Leonard of Philadelphia showed that the evidence furnished by the *x*-ray was to be relied on, even the negative evidence where the differentiation was clear. Bevan published a paper in the *Annals of Surgery* reporting 13 or 14 cases, and claimed that the *x*-ray as a means of diagnosis was to be relied on to a greater extent than any other means at our disposal in cases of kidney stone. He thinks the best exposition of this entire work is to be found in the *Beiträge für Chirurgie*, from the pens of Kümmel and Rumpell. Kümmel takes the position of Leonard and Bevan, and presents practically these conclusions, that the *x*-ray, properly used, will detect a stone in any individual, no matter how thick, and a stone of any chemical composition; that the detection of the stone does not depend so much on its chemical composition or the thickness of the individual as it does on the proper use of the *x*-ray. The conclusions of Kümmel, Leonard and Bevan are not accepted to-day. Most of the work done with the *x*-ray in kidney stone has been poor work. A lot of work done at hospitals and in laboratories and submitted to medical men as finished, expert *x*-ray work, is not really worthy of attention. He had seen plates taken by men who were not competent to interpret the findings and determine whether or not stone was present; then operate on the case, find no stone at the time of operation, and damn the *x*-ray. The *x*-ray does not lie in these cases. The *x*-ray has absolutely no fallacies. To be sure, there will be cases where the evidence is uncertain; where the individual who is doing this work, who is competent to do it and to interpret it, will place them in an uncertain group. On the other hand, the great majority of cases are very clear and definite, and belong to a group where there is stone or where there is no stone present.

In 27 cases positive findings and stones were found at operation in 13; in about the same number of cases negative findings, and at the time of operation other pathologic conditions than stone were found. There was one doubtful case which was clearly stone clinically, and it was found at the time of the operation. After the operation one could clearly see in the plates a stone behind the twelfth rib, in a position where it is not often found. The ordinary position of stone in these cases is an inch and a half from the transverse process and a little below the twelfth rib.

With reference to the differential diagnosis between stone and other lesions in the kidney, and between stone and other conditions, such as appendicitis, gallstone and some other complicating conditions on the right side, in a series of several hundred cases collected since the introduction of the *x*-ray and the use of it in kidney stone work, he has had three cases in which a diagnosis of appendicitis was made, where the evidence seemed to be definite—the appendix was removed—and where later the *x*-ray disclosed a stone in the kidney. It is difficult to say definitely whether the symptoms which occurred in these cases were at all times due to the stone, and the appendix was not the organ at fault. In two of these cases he believes the appendix had not given rise to any symptom. The history in all three was quite similar: A series of attacks, the appendix removed, and later attacks after the operation. Then, another review of the situation, with the *x*-ray picture determining the presence of stone, the stone removed and the patient cured. One rather interesting feature in one of these cases was found: After the removal of the appendix first and the stone later, the patient was not cured, and a further review of the case showed tubercle bacilli in the urine. One kidney was found normal, and in the other nephrectomy resulted in a permanent cure. In the differential diagnosis we should always consider gallstones. These stones very seldom show in the *x*-ray.

Diagnosis of Ureteral Stones.

DR. M. L. HARRIS stated that with the possible rare exception of a stone forming about a foreign body or an obstruction in the ureter, all ureteral stones have their origin in the kidneys, whence they migrate to some point in the ureter where they become arrested. Previous to the migration of a stone the patient may or may not have presented symptoms pointing to kidney trouble, but the act of migrating is almost always accompanied by excruciating pain, known as renal or ureteral colic. The pain does not usually cease suddenly, but disappears more gradually. After the stone becomes lodged it may remain latent for an indefinite period, provided it does not completely occlude the lumen of the ureter so as to prevent the passage of the urine around it. More commonly the patient has recurring attacks of pain of varying intensity and at variable intervals, similar to the original ureteral colic, or a more or less fixed pain or soreness at some point in the lumbar region or along the course of the ureter may persist. The urinary findings and other symptoms are such as are common to kidney stones, or a pyelitis, or ureteritis from other causes, and, therefore, in no way characteristic. Localized tenderness along the ureter, or an enlarged ureter, if detached, on palpation may have some significance, but is not conclusive. Stones lodged at the lower end of the ureter may be palpated at times through the vagina or, more rarely, through the rectum. With the aid of the *x*-ray stones can be recognized in all portions of the ureter. It should be remembered, however, that a skiagram is but a visible expression of the relative facility with which the *x*-rays are transmitted through the various substances which have been interposed. A correct interpretation of the shadows is very important, yet this may be difficult or even impossible without a knowledge of all of the collateral facts pertaining to the particular case in hand. Harris directed attention to the possibility of error in interpreting shadows which apparently lie in the course of the ureter, and particularly that portion of the ureter which is contained within the pelvis. When such shadows are found in this portion of the pelvis, with symptoms pointing to ureteral stone, the ureters should be catheterized in order to determine whether the shadow actually lies in the course of the ureter. The tip of the bougie may be waxed, so that contact with a foreign body, such as a stone, may be recognized by the indentations made in the wax.

An Attempt to Use the Electric Conductivity of Urine for Clinical Purposes.

DRS. GUSTAV KOLISCHER and LOUIS E. SCHMIDT have tried to determine the functional capacity of the kidneys from a new point of view. They tried to make every kidney a standard unto itself. They investigated whether the secreting efficiency of normal and abnormal kidneys might be influenced in a peculiar and characteristic way, so the osmotic concentration of the urine voided before and after staining certainly ought to show marked differences. The results of their investigations so far seem to bear out these theoretical speculations. As the most sensitive test they resorted to the test of electric conductivity, and as a method of staining they selected hypodermic injections of indigo carmin. After the stain is brought into the circulation, and after the urine becomes colored, the urine of normal kidneys always shows a slight decrease of electric conductivity, which depression, however, will never exceed nine international ohms. In case urine simultaneously drawn from both normal kidneys shows different electric conductivity before staining, the decrease of conductivity appearing after staining is exactly the same in either specimen. Urine drawn from pathologic kidneys will always, after staining, show a decided increase of electric conductivity. The authors believe they are justified in saying that any increase after staining of electric conductivity beyond ten international ohms is characteristic of impaired health of the kidney. If this increase stays inside the limits of twenty ohms, this kidney may be considered as safe in a surgical sense; that is, it can reasonably be expected to be of sufficient functional capacity to attend to the eliminating process after its mate has been removed. Any kidney whose urine after staining shows an increase of electric conductivity beyond twenty ohms has to be considered as absolutely unsafe in a surgical sense. They expect to be able to determine by this method in advance whether a given individual will react, as to his kidneys, favorably or unfavorably to the administration of a general anesthetic.

Diagnosis of Syphiloma of Kidneys.

DR. R. R. CAMPBELL read a paper on this subject which will appear in THE JOURNAL.

BOSTON MEDICAL LIBRARY MEETING.

Meeting held March 1, 1905.

Dr. Francis B. Harrington in the Chair.

SYMPOSIUM ON SURGERY OF RENAL AND URETERAL CALCULI.

Results of Cases at the Massachusetts General Hospital.

DR. HUGH CABOT found from 1897 to 1904, 26 cases, all of which were operated on. Age averaged 80 years; 8 females, 18 males; 15 in right kidney, 7 in left, 4 in both kidneys; 9 had marked hematuria, while all showed blood in the urine microscopically; all had pain; in 2 this was recent, though the calculi were large; 11 had renal colic; 10 had passed a small stone or gravel; 5 had a tumor, of which 3 were fatal; *x*-ray was used on 15 and was positive in 13; average duration of symptoms was six and a half years, showing how loath physicians are to refer such cases to the surgeon. Nephrectomy was the operation done in 3 cases, all of which recovered; nephrotomy was done 27 times on 21 patients, 4 of whom died; urethro-lithotomy was done on 2 patients. Two cases were operated on for appendicitis, one afterwards passing a stone and the other dying of uremia. There were 6 deaths, 2 from chronic sepsis, 1 from loss of substance, 2 from uremia and 1 from secondary hemorrhage eight days later. Thirteen were seen within the last month; 10 are well, 1 passes pus in urine, 1 has pain and 1 has pain and passes gravel as before the operation.

Actual Results of Cases at the Boston City Hospital.

DR. J. H. CUNNINGHAM, JR., reported 43 cases; average age 33 years; 33 males, 10 females; 30 in right kidney, 10 in left and 3 in both kidneys; *x*-ray was used on 7; positive in 6. Urine was acid in 40 cases, alkaline in 1, neutral in 1, and always contained blood. No case had any gouty symptoms. Pain in 36 cases; renal colic in 20; lumbar pain in 13. All were tender to pressure over the affected kidney. Five had tumor; 16 had hematuria; 33 pyuria; 10 had passed calculi before. Largest one removed weighed 5 ounces. Fifteen were operated on, with 2 deaths, one aged 53 from shock, one aged 34 from pyonephrosis. Lumber operation was employed in 13 cases. Seven cases are well after several months or years. In the series was included one patient operated on by the method of nephro-lithotomy by Dr. William Ingalls. The man recovered and lived for twenty years. This was probably the first time this operation was done, being ten years before the first case reported by Dr. Morris, though reported later than Dr. Morris' case.

DR. HENRY F. HEWES read a detailed description of the best methods to be employed in the diagnosis of renal calculi from the examination of the urine.

Other Means of Diagnosis of Calculi.

DR. BENJAMIN TENNEY compared statistics of Morris and others with his own report of 128 cases of ureteral calculi made last year. He had been over the autopsy reports of the Massachusetts General Hospital and the Boston City Hospital since 1896 and among 3,807 found 16 cases of calculi in kidney, 8 in ureter and 3 in both kidney and ureter. Gallstone was seven times more common. Aside from the examination of urine the *x*-ray is the most accurate single means of diagnosis. Other useful means are catheterization of ureters, cystoscopy, palpation and possibly the "stamping test."

Operations for Renal and Ureteral Stone.

DR. PAUL THORNDIKE said the operator should be ready for a complete operation, laying kidney out on loin and splitting it. Such split sides should be kept pressed together or hemorrhage will occur through the ureter into the bladder. The question of nephrectomy versus nephrotomy depends on amount of tissue remaining, and on the condition of the other kidney. Ureteral calculi are apt to be near the kidney, at the pelvic brim or near the bladder. At the lower end they may be reached through the bladder, vagina or urethra; at the pelvic brim through the rectum, by perineal section, through the sacrum, by abdominal section, through the vagina, or by the extraperitoneal operation in the iliac region near Poupart's ligament.

DISCUSSION.

DR. E. W. CUSHING said cases may have the symptoms and no stone. In deciding whether to do nephrectomy or nephrotomy many things must be considered, among others the renal fistula which is apt to follow the latter. In attempts to get at the ureter it is useful to remember that it keeps with the peritoneum, not with the blood vessels. Because of the difficulty of following it down into the pelvis it is often best to do an abdominal operation.

DR. EDWARD REYNOLDS said it was important to decide early whether nephrectomy was to be done or nephrotomy, and that the information to be gained by catheterization of the ureters, so easy in women, was very useful. The surgeon then knows whether the other kidney is doing good work or whether it is necessary to preserve all possible kidney tissue. He protested earnestly against the use of the wax-tipped bougie, which he considers a very dangerous instrument.

DR. EARNEST A. CODMAN, with an experience of 25 cases of *x*-ray work, feels that it is of doubtful value. Unless a well-marked shadow of the last rib is visible in the radiograph, a calculus can not be expected to show though it may be present.

DR. PAUL THORNDIKE spoke of a uric-acid calculus which showed clearly in a radiograph and said that it might be explained by the associated urates.

DR. F. B. HARRINGTON spoke of the valuable aid to be gained from an elastic clamp applied after the kidney is delivered on the loin. An opening may sometimes be made into the pelvis of the kidney and considerable quantities of detritus removed by a curette without damaging the kidney substance at all.

Therapeutics

[It is the aim of this department to aid the general practitioner by giving practical prescriptions and, in brief, methods of treatment for the diseases seen especially in every-day practice. Proper inquiries concerning general formulae and outlines of treatment are answered in these columns.]

Pharyngitis.

In the treatment of the acute forms of pharyngitis, E. F. Ingals states that when the portal circulation is sluggish the occasional administration of salines and mercurials is indicated. Poor digestion must be corrected by bitter tonics. The following is recommended by some authorities applied locally:

R.	Argenti nitratis	gr. xxx	2
	Aquæ destil.	℥i	30

M. Sig.: To be applied locally on a swab

In applying this solution the tongue should be depressed as far as possible and the application made quickly from the lower part of the pharynx upward, by which procedure the whole pharynx is treated at once. Care must be observed that the solution does not come in contact with the epiglottis, nor drop into the pharynx, otherwise acute edema may develop and produce great dyspnea. In the chronic form of pharyngitis, Ingals recommends eliminants and tonics. Arsenous acid internally is also advised, combined with nux vomica, as follows:

R.	Acidi arsenosi	gr. i	.06
	Ext. nucis vom.	gr. x	.65
	Ext. cascaræ sagradæ	gr. xii	.75

M. Ft. capsulæ No. xxiv. Sig.: One capsule before each meal.

Locally he recommends the following as an insufflation into the nasopharynx in those cases presenting several enlarged follicles providing the surrounding mucous membrane is moist:

R.	Hydrastis muriatis	gr. xxv	1.65
	Pulv. acaciæ q. s. ad.	gr. c	6.65

M. Sig.: To be used as an insufflation into the nasopharynx.

In the mild cases local astringents are desirable, and for this purpose he recommends the troches of krameriæ compound, and the following spray to the pharynx:

R.	Cupri sulphatis	gr. x-xx	.65-1.30
	Aquæ	℥i	30

M. Sig.: To be used as a spray twice daily.

When the foregoing treatment is not sufficient to effect a cure, cauterization of the follicles is recommended, using either nitric acid, chromic acid, or better, the galvanocautery and cauterizing only two or three follicles at a time. The treatment is repeated every four or five days.

As a local antiseptic, some authorities recommend the following combination:

R.	Tinct. iodi	℥i	4
	Acidi carbol.	gr. vi	.30
	Acidi tannici	gr. xx	1.30
	Glycerini q. s. ad.	℥ii	60

M. Sig.: Apply with a swab two or three times daily.

Yeo recommends the following combinations in the treatment of the different forms of pharyngitis:

R.	Acidi carbolici	℥ss	2
	Cocainæ hydrochlor.	gr. iv	.25
	Glycerini	℥ii	8
	Aquæ rosæ q. s. ad.	℥vi	180

M. Sig.: To be used as a gargle or a spray two or three times daily in the acute forms of pharyngitis; or:

R.	Acidi tannici	gr. xii	.75
	Tinct. iodi	m. v	.30
	Acidi carbol.	gr. xxx	2
	Glycerini	℥ss	15
	Aquæ q. s. ad.	℥iii	90

M. Ft. lotio. Sig.: Paint the throat with this solution three times daily.

As a gargle in catarrhal angina the following is of value:

R.	Aluminis	℥iss	6
	Tinct. opii	℥ss	2
	Mellis	℥ii	8
	Syr. rosæ (B. P.)	℥iii	12
	Aquæ q. s. ad.	℥viii	240

M. Sig.: To be used as a gargle.

When the throat is relaxed and reddened the following may be used:

R.	Tinct. capsici		
	Acidi tannici, āā	℥ss	2
	Infus. rosæ acidi	℥iii	90
	Aquæ q. s. ad.	℥v	150

M. Sig.: To be used as a gargle.

The following astringent solution, in some cases, may serve the purpose better:

R.	Aluminis	℥iv	15
	Acidi tannici	℥i	4
	Mellis	℥i	30
	Aq. rosæ q. s. ad.	℥viii	240

M. Sig.: To be used as a gargle.

In cases of chronic pharyngitis the following combinations are recommended:

R.	Glycerini acidi carbol. (B. P.)	℥iiss	10
	Acidi tannici	℥i	4
	Tinct. capsici	℥ss	2
	Infusi rosæ acidi q. s. ad.	℥vi	180

M. Sig.: To be used frequently as a gargle; or:

R.	Ammon. chloridi	℥ss	2
	Mellis		
	Syr. rosæ, āā	℥ss	15
	Aquæ q. s. ad.	℥vi	180

M. Sig.: As a gargle several times during the day.

Sodium Hyposulphite.

This preparation is recommended by Shoemaker in the treatment of scabies, applied as follows:

R.	Sodii hyposulph.		
	Aquæ destil., āā	℥iii	90

M. Sig.: Apply locally to the affected parts after a morning bath, and allow it to dry on the skin. Before going to bed the skin is bathed with the following lotion:

R.	Acidi hydrochlor. dil.	℥iii	90
	Aquæ destil.	℥vi	180

M. Sig.: Apply locally at night.

In the treatment of thrush or sprue occurring in infants or adults the following combination is of value:

R.	Sodii hyposulph.	℥iii	12
	Glycerini	℥iss	6
	Aquæ q. s. ad.	℥ii	60

M. Sig.: Apply locally on a piece of absorbent cotton or antiseptic gauze. It will do no harm if the infant should swallow any of the solution. Sodium hyposulphite is also of service as an antiseptic when sarcinæ are present with vomiting.

R.	Tinct. gentianæ co.	℥ii	8
	Tinct. capsici	℥ss	2
	Sodii hyposulph.	gr. xl	2.65
	Spts. chloroformi	gtt. vi	.25
	Aquæ q. s. ad	℥viii	240

M. Sig.: Two tablespoonfuls three times a day.

Psoriasis.

The following combinations are recommended by *Med. Bulletin* in the treatment of psoriasis:

R.	Sulphuris precip.	gr. iii	.20
	Salol	gr. ii	.12
	Olei gaultheriæ	m. ss	.03
	Acidi arsenosi	gr. 1/30	.002

M. Ft. cap. No. i. Sig.: Two capsules three times a day for an adult.

Locally the following may be used:

R.	Acidi salicylici	℥i	4
	Ung. hydrarg. nitrat.		
	Ung. aquæ rosæ, āā	℥ss	15
	Olei eucalypti	℥ss	2

M. Ft. unguentum. Sig.: To be applied locally.

Hyperidrosis.

Unna, in an abstract in *N. Y. Med. Jour.*, recommends in the treatment of hyperidrosis that the affected parts be washed

with spirits of camphor or with a weak solution of vinegar. As a local application the following is advised:

R.	Ichthyol.		
	Spts. terebinthinæ, āā	℥v	20
	Ung. zinci oxidi	℥x	40

M. Ft. unguentum. Sig.: To be used locally on retiring. In the shoes the following may be sprinkled:

R.	Pulv. sinapis	℥i	4
	Pulv. talci	℥iv	120

M. Sig.: To be sprinkled in the shoes.

When the hands alone are affected a half teaspoonful of the following may be thoroughly rubbed into the hands after each washing:

R.	Spiritus oderatus	℥iii	90
	Tinct. belladonnæ	℥ss	15

M. Sig.: To be applied locally to the hands.

Multiple Warts.

Mantelin, in *Merck's Report*, recommends the following in the treatment of multiple warts:

R.	Chloralis hydratis		
	Acidi acetici, āā	℥iss	6
	Acidi salicylici		
	Spts. etheris, āā	℥i	4
	Collodii	℥iv	15

M. Sig.: Apply locally to the warts twice daily.

Removal of Nevi.

Neiswanger recommends in the removal of nevi that the child be put to sleep and the positive electrode of the galvanic battery, well moistened in a warm saline solution applied to the abdomen. To the cathode attach the needle holder in which is fastened a suitable needle, generally a long, slender one, from which the temper has been drawn. After the seat of operation has been cleansed and the needle has been drawn through an alcohol flame, it is passed almost through the mark, superficially and parallel with the epidermis. The strength of the current used should depend on the distance the needle has been inserted, but the strength usually varies from one-half to eight milliamperes, which should be maintained until the usual blanched appearance indicative of decomposition is obtained. In like manner, every portion that is red should be attached as many times as necessary.

The part should then be dusted with boric acid and in about one week a dark crust covers the whole area which should not be disturbed until about ready to drop off. If the mark has not been very large, the resulting scar will be almost entirely absorbed in a few months and even where the area involved has been rather large the scar will scarcely be noticeable after one year because the caustic action of the negative electrode, like that of any alkaline caustic, leaves a soft cicatrix that is rather easily absorbed.

Medicolegal

Ship Not Liable for Malpractice.—The United States District Court in New York holds (The Napolitan Prince 134 Federal Reporter, 159) that the errors, mistakes or negligence of its official physician in treating a passenger for an injury were not imputable to a ship, it not being shown that the ship was negligent in selecting them.

Physician, Consulted for Examination Only, as Witness.—The Supreme Court of Wisconsin says that, in James vs. state, a child who was alleged to have been raped was taken by her mother to a physician a few days after the alleged offense, to be examined for the purpose only of determining whether she then had a venereal disease, it appearing that the party accused of committing the rape was suffering from that disease at the time of the alleged offense. The physician was called on the stand and was allowed to testify, against objection, as to the results of his examination, and this ruling was assigned as error on the ground that the information obtained by him was privileged under section 4075 of the Revised Statutes of Wisconsin of 1898. But the Supreme Court holds that the ruling was correct, because such information is privileged only when required and obtained for the purpose of enabling the physician to prescribe for the patient as a physician or to act as a surgeon.

Liability for Care of Smallpox Patients.—The Supreme Court of Iowa says, in the case of Resner vs. Carroll County, an action brought by a physician to recover for services rendered in caring for a smallpox patient in 1902, that the statute in force at the time the services were rendered and the bill approved and presented to the county board provided that persons found to be afflicted with smallpox should be taken charge of and cared for by the local board of health, the expense thereof to be charged to such person, or those liable for his support, if able; otherwise such expense to be charged to the county. Code 1897, section 2570. And under the statute as it then stood the power to fix the fees or charges—those of the physician, for instance—was in the local board of health. The county board had no right to regulate such fees or charges. Its duty was to order the same paid as audited and approved by the local board. It followed that when the local board met and approved the bill of the plaintiff, and it being true that the patient and those liable for his support were unable to pay, the indebtedness against the county became absolute. And this was true without reference to certification, or the want thereof, to the county board. The board bound no one by its action in allowing a portion of the bill and rejecting the rest. As the demand of the plaintiff against the county was of a fixed and definite sum, he waived no right by taking the amount allowed. He had no conference with the board, which alone was authorized to act on the part of the county, and the acceptance of part of a fixed sum due did not operate to bar a claim for the balance unless mutually agreed, and on consideration. In the case of an unliquidated demand a different rule may obtain.

Consent to Postmortem Examination Construed.—The Supreme Court of Iowa says, in the case of Winkler vs. Hawkes and others, an action brought by a widow to recover for physical and mental anguish alleged to have been caused by the wrongful mutilation of the body of her husband and the removal of some of its parts, that it fully appeared that she understood the purpose of the examination was to ascertain the cause of her husband's death, and that she consented to it for that purpose. The consent being given, the Supreme Court thinks it must be held to imply a permission to the surgeons to conduct such examination in the approved and usual manner practiced by their profession; and, if the removal of some of the organs for microscopic examination was necessary or proper to effect the purpose of the postmortem, then the defendants would not be guilty of an actionable wrong in so doing, unless such permission was expressly withheld at the time the consent to open the body was given. It was true that the plaintiff claimed she made it a condition of her consent that none of the parts should be taken away, but that question was submitted to the jury, which evidently found against her contention in this respect. Moreover, the condition that none of the parts should be taken away did not necessarily prohibit the taking of such parts to the office of the surgeons for examination, if they were duly returned and replaced for burial, and this appeared to have been done. The fact seemed to be that the surgeons removed the heart and liver, in whole or in part, from the body, and took them from the undertaker's room for further examination; and, on hearing that the plaintiff objected thereto, the parts were at once returned and buried with the body. There was no indication that the surgeons acted otherwise than in entire good faith, and the court believes that their acts in the premises were fairly within the scope of the consent which the plaintiff conceded that she gave.

Statements of Injured Person to Physician.—The Court of Appeals of Kentucky says, in the case of Shade's Administrator vs. Railroad, Transfer and Bridge Co., that it was contended by the plaintiff that the declarations made to her physician in explanation of the cause of her injury by an injured party, and made to enable him to treat it, were of the essential cir-

cumstances of the case (*res gestae*), and receivable in evidence as such. Here the party whose statement was offered to be proved, the court says, was suffering from physical injury. What she said to her physician as to the pain it then caused her, and the effect it had on her senses, was necessary for him to know in order that he might intelligently treat the injury. Under such circumstances, it is presumed that the party suffering will state truly how she is affected, as otherwise the medical man might be at a loss as to the remedies needful to her condition. The incentive for a fair statement is so great that the presumption is she will not hazard an untruth to better her financial condition, as by fabricating a basis of claim against the person charged with her injury at the expense of her permanent health, or may be of her life. For that reason the law will allow the proof of what she said to her physician at the time of his examination as a part of the *res gestae*. What the injured party may have said to any one at the time of the injury, or so immediately after it as to be regarded part of it, as being the verbal part of a continuing occurrence, would also be admitted, on familiar grounds. What was said after the lapse of some minutes—a half-hour or so in this case—to the attending physician, to aid him in determining the nature of the injury and to prescribe a remedy or treatment, is allowed, as an extension of the same rule of evidence. It rests logically on the necessity of the case. It is matter proper to be shown, and not susceptible generally of being otherwise proved. But it must stop with the necessity for it. It was necessary for the physician to know whether the patient was suffering, and where the pain was, and as to its character. It was also proper that he should know how the injury was inflicted, as on that knowledge his treatment in part, might depend. So it was competent to show that the patient said she had received a blow on her head, if she did say it, and how she was otherwise hurt. But it was wholly immaterial to the physician's understanding what it was necessary for him to know in treating the injuries whether she fell on the defendant's bridge or elsewhere, or that she fell on ice.

Current Medical Literature

AMERICAN.

Titles marked with an asterisk (*) are abstracted below.

American Medicine, Philadelphia.

March 18.

1 *Cholecystitis as a Complication of Lobar Pneumonia: with a Report of Three Cases and Remarks on Icterus in Pneumonia. J. M. Anders, Philadelphia.
2 Primary Tuberculosis of the Female Breast, with a Report of a Recent Case. G. W. Spencer, Philadelphia.
3 Dissertation on Temperament, Diathesis, Dyscrasia, Predispositon, Cachexia, Susceptibility, Idiosyncrasy and Heredity. (To be continued.) Homer Wakefield, N. Y.
4 *Surgical Treatment of Bright's Disease. W. H. Thomas, Philadelphia.
5 Etiology and Pathology of Bright's Disease. W. E. Robertson, Philadelphia.
6 *Postoperative Nasal Hemorrhage; Calcium Chlorid; Secondary Anemia; Rapid Recovery. R. W. Wilcox, N. Y.

1. **Cholecystitis Complicating Pneumonia.**—Three cases of lobar pneumonia complicated with cholecystitis are reported by Anders. The cases apparently were of the catarrhal type and of mild grade, since resolution promptly occurred in two. None of the cases was sufficiently well marked to constitute a grave complication. The local symptoms and physical signs are characteristic, but the type of condition is not severe, hence, to a great extent, it is overshadowed by the grave underlying or pneumonic condition. No general or constitutional symptoms distinctive of the lesion are recognizable. The clinical course of the pneumonia is not materially modified, as a rule, by the occurrence of catarrhal cholecystitis as a complication. The source of the infection is probably the gastrointestinal tract or less commonly, perhaps, the channel of transmission of infection is a blood vessel or a lymph vessel.

4. **Surgical Treatment of Bright's Disease.**—A review of the literature of decapsulation of the kidney made by Thomas shows that of 31 cases of chronic interstitial nephritis, 10 patients (33.24 per cent.) were cured, and 4 (12.7 per cent.) died within two weeks. Of 12 cases of chronic parenchymatous nephritis 3 patients (25 per cent.) were cured, and 1 (8.3 per cent.) died within two weeks. Of 25 cases of chronic diffuse nephritis 3 patients (12 per cent.) were cured, and 2 (8 per cent.) died within two weeks. The anesthetic was nitrous oxid and ether in 42 cases, ether alone in 17 cases, nitrous oxid and oxygen in 8 cases, chloroform alone in 2 cases, nitrous oxid and chloroform in 1 case, nitrous oxid, ether and chloroform in 1 case, and nitrous oxid, oxygen, ether and chloroform in 1 case.

6. **Postoperative Nasal Hemorrhage.**—Wilcox reports a case of nasal hemorrhage following the removal of the inferior half of the middle turbinal and a small spur under cocain and adrenalin chlorid by means of the snare and saw. On the fourth day following gymnastic exercise a profuse hemorrhage occurred, which resisted the ordinary treatment and continued for six days. In the meantime the patient was given large doses of calcium chlorid, 40 grains, per day. Wilcox emphasizes the importance of the administration of calcium chlorid, either by mouth or rectum, coincidently with the surgical methods of controlling hemorrhage, and ascribes the successful issue in the case reported to the calcium chlorid given. For adults, 40 grains in two ounces of water, once daily, will accomplish the desired result.

Medical Record, New York.

March 18.

7 *Results of 1,500 Operations for the Radical Cure of Hernia in Children, Performed at the Hospital for Ruptured and Crippled Between 1891 and 1904. W. T. Bull and W. B. Coley, N. Y.
8 *Acne and Its Treatment. G. T. Jackson, N. Y.
9 *Limitations of the Value of Nitroglycerin as a Therapeutic Agent. H. P. Loomis, N. Y.
10 Physiologic Aids; or the Practical Use of Well-known Laws of the Mind. E. C. Savidge, N. Y.
11 Report of a Case of Vaginal Cesarean Section with Recovery. Simon Strauss, N. Y.

7.—The principal points in this article were covered in Dr. Coley's article in THE JOURNAL, Jan. 14, 1905, page 112.

8. **Treatment of Acne.**—Jackson places the greatest reliance on sulphur used in the form of lotio alba, to which is added a dram or more of precipitate of sulphur to each four ounces of the mixture. He advises the restriction of the use of the Roentgen ray to intractable cases, and to the disease as it occurs on the trunk. When they are used it is advised that a moderately hard tube should be used, that the patient should be seated from 8 to 10 inches from the target, that the exposure should last from three to six minutes and that the sittings should be at intervals of three or four days for from ten days to two weeks.

9. **Value of Nitroglycerin.**—Experiments have been carried on by Loomis for the purpose of determining the therapeutic scope of nitroglycerin. He found that the usual dose of 1/100 of a grain is entirely too small to produce any effect in pathologic conditions; 1/50 of a grain is a minimum dose, although persons vary greatly in their susceptibility to its influences. A great many are not affected at all, even by large and repeated doses, especially persons of phlegmatic temperament. In some people a tablet of 1/100 grain by the stomach will produce no effect, but let that same individual dissolve a 1/100 grain tablet in the mouth and the physiologic effect of the drug will be notable. Loomis, however, considers nitroglycerin a perfectly safe drug to use. He has never seen any ill-effects following its use even in large and repeated doses. High arterial pressure in man is not perceptibly affected by it, nor is dilatation of the blood vessels apparent. The ordinary dose of 1/100 of a grain every four hours could not possibly have any effect on the arteries. Although nitroglycerin is said to increase the quantity of the urine in chronic Bright's disease Loomis was never able to satisfy himself that any increase seen was due to this drug. He believes that in conditions due to arterial spasm, so-called, such as angina pectoris, migraine and asthma, nitroglycerin may be of benefit, in full doses

often repeated, but not in arterial sclerosis where the arteries themselves are more or less changed.

Boston Medical and Surgical Journal.

March 16.

12 Abuse of Medical Charity. G. W. Gay, Boston.
13 Some Abuses of Medical Charity. H. Derby, Boston.
14 Abuse of Medical Charity in London. J. W. Elliot, Boston.
15 Private and Public Hospital. Alfred Worcester, Waltham.
16 Regulation of Medical Charity. F. Cobb, Boston.
17 Medical Charity; a Possible Remedy. John C. Munro, Boston.
18 Medical Charity at the Massachusetts General Hospital. F. A. Washburn, Jr., Boston.
19 Physician and the Hospital Private Patient. E. W. Cushing, Boston.
20 Certain Faults in Medical Charities. Samuel Crowell, Dorchester.
21 Abuse of Medical Charity in the Suburban Districts. Charles H. Cook, Natick, Mass.

New York Medical Journal.

March 18.

22 Gonococcus Infections in Children, with Especial Reference to Their Prevalence in Institutions and Means of Prevention. (To be concluded.) L. Emmett Holt, N. Y.
23 After-treatment of Abdominal Sections with Eserin Salicylate. Daniel H. Craig, Boston.
24 New York Board of Health and the Antispitting Crusade. W. Freudenthal, N. Y.
25 Opium Smoking Readily Cured. W. H. Jeffreys, Shanghai, China.
26 Subcutaneous Injuries of the Abdominal Walls and Viscera. (Concluded.) D. N. Eisendrath, Chicago.
27 *Tuberculous Meningitis with Congenital Stricture of the Rectum. Clinical and Pathologic Reports. H. S. Wieder, Philadelphia, and H. L. Springer, Wilmington, Del.
28 *Study of the Stomach Function in Pulmonary Tuberculosis J. E. Munson, Ann Arbor.
29 Case of Acute Turpentine Poisoning. G. Hausser, Cincinnati.

27. **Tuberculous Meningitis with Rectal Stricture.**—The tuberculous meningitis in the case reported by Wieder and Springer occurred in a child 4½ years of age with a family history of tuberculosis on the mother's side in three members of the family. Of bearing in the previous medical history was the fact that she was obstinately constipated during the first six months of her life, never obtaining a bowel movement except by artificial means. The absence of inflammation and the previous history are evidence that the stricture was probably congenital. The patient died as a result of the meningeal trouble.

28. **The Stomach Function in Tuberculosis.**—Munson has examined the stomach function in 26 cases of pulmonary tuberculosis and has found a marked tendency to hypoacidity, which is frequently transformed into anachlorhydria. The motor power is undisturbed. The first group examined included 10 cases early in the disease, the duration not exceeding nine months. In 8 cases there was a history of stomach symptoms, which in some cases antedated the lung condition and in others introduced or accompanied it. In 4 cases hydrochloric acid was always found, in 1 it was always absent, in 5 it was variable. Peptic digestion and the motor power seemed unchanged. In a second group of 11 cases of intermediate severity the duration of the disease was from five months to two years. Hydrochloric acid was present in 6 cases, absent in 3, variable in 1 and doubtful in 1. Peptic digestion was undiminished. In 5 cases of advanced tuberculosis the qualitative test for free hydrochloric acid was present once, absent twice, and at times was found in the remaining 2 cases. Peptic digestion was usually decreased. The acidity in the first group was about normal, but in the other two groups it was markedly diminished. Munson says that one may assume, in cases where previous dyspepsias can be eliminated, that the digestive disturbances which introduce or accompany the tuberculous process are manifestations of the reaction of the system to toxic products; a reaction analogous, perhaps, to the rise of temperature following the administration of tuberculin.

Medical News, New York.

March 18.

30 *Fresh-Air Treatment of Surgical Tuberculosis. L. R. Williams, New York.
31 *Aural Affections in Children; Necessity for Their Early Recognition by the Family Practitioner. H. Jarecky, New York.
32 *Widal Test for Practicing Physicians. J. H. Borden, New York.
33 Technic of Perineal Prostatectomy. G. R. Fowler, Brooklyn.
34 Superficial Inguinal Hernia, with Report of a Case. A. E. Sellenings, New York.
35 Importance of the Physical Examination of the Back in General Diagnosis. J. P. Arnold, Philadelphia.
36 Local Anesthesia by Cataphoresis and by Mechanical Pressure. W. J. Morton, New York.

30. **Fresh-Air Treatment of Surgical Tuberculosis.**—Williams speaks of the work that is being carried on by the New York Association for Improving the Condition of the Poor at its temporary hospital at Coney Island. The children suffering from surgical tuberculosis live in tents and are treated much like pulmonary cases as regards fresh air, good food and an abundance of it, and rest. The children are given daily sea baths until October. The windows in the wards are kept open except for a half-hour during the time the children dress and undress. Considerable stress is placed on the care of the mouth and teeth. The children brush their teeth twice daily and the services of a dentist are called when necessary. The patients, almost without exception, have improved, though the hospital has cared for every variety of the disease, the far advanced as well as the incipient.

31. **Aural Affections in Children.**—Attention is called by Jarecky to the necessity of the early recognition of ear complications in children by the family practitioner. Pus formation may often be prevented, or, if already formed, its absorption may be checked. Early paracentesis may prevent extension from the tympanum to the mastoid cells, brain, internal ear and sinuses, as well as the partial loss of hearing. He advises that all cases of earache and discharging ears should be properly attended to, and that in all inflammatory diseases the ears should be repeatedly examined during the course of the disease.

32. **Convenient Widal Test.**—The emulsion used by Borden was made from a well-tried strain of typhoid bacilli grown for twenty-four hours on slant agar in large tubes. The bacilli are washed from the medium with a mixture of sterile salt solution, 450 parts; glycerin, 50 parts; 95 per cent. carbolic acid, 2.50 parts; 50 c.c. of the solution are sufficient to wash one large agar tube. After one week the solution becomes translucent and the bacilli on being transplanted failed to grow. It is then ready for use, and is permanent, if kept in sterile bottles in a moderately cool and dark place. With such a suspension 30 cases of typhoid and 27 controls were tested. Of the 30 cases, 29 agglutinated in an accurate dilution of 1 to 100. None of the controls reacted with the serum diluted 1 to 40. The reaction, if positive, occurred within 20 hours. Six controls stood for eight days without apparent change of any sort, and many others from 48 to 72 hours. The average day when the reaction was obtained first was the patient's seventh day in bed. Twenty-five cases were positive on the first examination—the earliest possible on admission. The technic of the method is as follows: 1. The blood is collected in bulbs with a small vent-hole at one end and drawn to a capillary tube at the other. It is only necessary to prick the ear rather briskly with a Hagedorn needle and to keep the tip of the bulb to the exuding drop. When the bulb is two-thirds full it is held for one minute in a slanting manner and laid aside for from one to two hours, when about 0.2 c.c. of serum will have separated. 2. From a modified Schuster dropping bottle with a very small lumen in a spout, a small graduated test tube is filled to the 1 c.c. mark with sterile salt solution. The large end is broken from the bulb at the file mark, and with a capillary tube drawn to a long point and graduated in one-hundredths of a c.c., enough serum is drawn up to make, with the salt solution, the dilution required. The pipette with the contained serum is then inserted into the test tube and thoroughly washed out with the salt solution. 3. From another dropper enough of the typhoid suspension is added to bring the fluid in the test tube to the 2 c.c. mark. The mouth of the tube is then stopped with a plug of non-absorbent cotton, inverted once or twice and set aside in a dark place. If the reaction is positive a marked granularity of the fluid in the tube will be noted. Following this there will be seen distinct clumps beginning to sink toward the bottom, and at the conclusion of the reaction the fluid above will be linty and free from clumps and the point of the

tube will contain a small, white flocculent mass of agglutinated bacilli. The method is particularly adapted for use by the general practitioner because of its simplicity and freedom from danger.

Lancet-Clinic, Cincinnati.

March 18.

37 Nitrous Oxid-Ether Series by Means of a New Inhaler. S. Iglauer, Cincinnati.
38 Cesarean Section. J. U. Barnhill, Columbus.
39 Radical Cure of Inguinal Hernia. A. Schachner, Louisville.

St. Louis Medical Review.

March 11.

40 Burns and Their Treatment in General Practice. A. S. Daggette, Pittsburg.
42 Synopsis of the Nutrition of Man of Dr. Walther Nic Clemm, of Darmstadt, Germany. (Continued.) A. Rose, New York.

Laryngoscope, St. Louis.

February.

43 Results of Partial Inferior Turbinectomy. G. B. McAuliffe, New York.
44 *Therapeutic Value of Medicated Ointments in Certain Affections of the Nasal Chambers. A. W. MacCoy, Philadelphia.
45 Primary and Secondary Tonsillar Hemorrhage Following Tonsillectomy with Tonsillotome and Snare. E. J. Brown, Minneapolis.
46 A Century of Intubations. G. F. Cott, Buffalo.
47 Syphilitic Tracheostenosis Dilated During Active Ulceration by a Long Intubating Tube. L. M. Hurd, New York City.
48 New Tongue Depressor. A. G. Bryant, Boston.
49 Improved Nose, Throat and Ear Instruments. E. Pynchon, Chicago.

44. Medicated Ointments in Nasal Disorders.—A note of warning is sounded by MacCoy with regard to the increasing bent toward surgical procedures for the relief of diseases of the nasal chambers. In many cases medicinal treatment proves far more effective than surgical intervention. The constant and persistent use of nasal washes, especially during the winter season, tends to harmful results. By the employment of curative medicaments in the form of soft ointments in the nasal chambers certain risks following the use of washes can be avoided and a speedier cure is effected. MacCoy has largely substituted the use of nasal washes, sprays and powders for home treatment by the prescribing of ointments, based on the individual requirements and the local needs of each patient. These ointments should be dispensed in collapsible tin tubes as a protection from contamination.

Brooklyn Medical Journal.

March.

50 Some Forms of Dyspnea and Their Treatment. J. A. McCorkle.
51 Five Obstetrical Examinations. R. L. Dickinson.
52 *Semeiology of Vomiting in Children. E. H. Bartley.
53 *Intestinal Anastomosis with the Aid of Accessory Support to the Intestinal Wall; also a Description of An Operation for Suturing the Intestine Without Support. G. Wackerhagen.
54 Anterior Metatarsalgia; Report of Six Cases. C. D. Natler.
55 *Duke's Disease. B. Edson.
56 Mirror Writing in the Right Handed. R. Kingman.

52. Vomiting in Children.—Bartley directs attention to the distinction that must be made between habitual vomiting or eructation of food in infants and young children and true vomiting. The classification of vomiting adopted by him is the following: 1, Gastric vomiting occurring in cases of acute gastric indigestion; 2, reflex vomiting caused by irritation or inflammation in the intestine, peritoneum, appendix, lungs, pleura or brain; 3, cerebral vomiting, accompanying both acute and chronic irritation of the brain and its membranes; 4, bloody vomiting, which must be differentiated from false hematemesis; 5, febrile or toxic vomiting, occurring at the outset of a number of affections, specially scarlatina and smallpox; 6, cyclic or recurrent vomiting, occurring without apparent cause; 7, vomiting of exhaustion, seen during apparent convalescence from diphtheria, scarlatina, pneumonia, etc.

53. Intestinal Anastomosis.—The various mechanical aids to intestinal anastomosis which have been brought forward by Wackerhagen are reviewed in this article. He also describes an operation in which he uses rubber-covered clamps. Openings are made in the intestine, through which the rubber-covered blades are introduced and clamped and the intestines are closed by a simple, continuous Lembert suture. To those who prefer plain suturing in intestinal anastomosis he suggests the following: After excision and closure of the ends of the intestine the two segments are brought together side by side and guy loops are introduced at points opposite the mesentery representing the length of the anastomosis to be made. A colored silk suture about 24 inches long with a knot 10 inches from its end, is introduced one-half inch beyond loop B, and the Cushing suture is inserted between the two segments toward loop A, and to a point one-half inch beyond loop A, where a backward retention stitch is taken. Slit with scissors, one segment of intestine parallel to and one-quarter inch from the Cushing suture; the same is done with the other segment, and the three inner edges of the slits are brought together by a continuous overhand suture, including all the coats. The same is done with the outer edges. Beginning at loop B, the Cushing suture is threaded and applied as a second Cushing stitch toward loop A, where the end is tied to that of the original Cushing suture. This method is essentially the plan of Abbe and Halsted with simplified technic. Two sutures are used, the Cushing outside and the overhand inside, the work being done continuously back and forth from below upward.

55. Duke's Disease.—Edson describes 64 cases of a contagious eruptive disease of an unusual character which occurred among the inmates of a hospital for children. The period of incubation was about fourteen days. The eruption, which was distinctly papular, pale in color, with no tendency to bat's wing grouping, appeared first on the face, particularly around the mouth, and extending to the cheeks, forehead, neck, and downward over the body and limbs. The time to the full development was one day. It disappeared in the order of its onset inside of two or three days. The temperature did not go over 100; there was no increase in pulse or in respiration; no coryza or bronchitis; no loss of sleep or appetite; no pruritus; no enlargement of glands; no desquamation, except in one case; no complications and no sequelæ. In about a dozen cases Koplik's spots were present. The ages of the children were from 4 to 13 years; only one adult, a woman of 32, contracted the disease, although others were exposed to it. Edson is of the opinion that these were cases of the Fourth disease, or Duke's disease, which he believes is really a rubella morbilliforme.

American Journal of the Medical Sciences, Philadelphia.

March.

57 *Review of 1,000 Operations for Gallstone Disease, with Special Reference to Mortality. W. J. Mayo and C. H. Mayo, Rochester, Minn.
58 Pseudo-malarial Types of Infective Endocarditis. W. Coleman, New York City.
59 Disseminated Syphilitic Encephalitis. A. M. Barrett, Danvers, Mass.
60 Effect of Alternating Currents of Moderate Frequency on Dogs. G. W. Crile and J. J. R. MacLeod, Cleveland.
61 Physiologic Relationship of Blood Plasma Proteids. T. S. Githens, Philadelphia.
62 *Incidence of Gastric and Duodenal Ulcer in Philadelphia. A. P. Francine, Philadelphia.
63 *Albuminuria in Appendicitis and Hernia. F. E. Bunts, Cleveland.
64 *Is Transplantation of Cord Necessary in Radical Cure of Inguinal Hernia? F. G. Connell, Salida, Col.
65 Case of Chronic Pyelitis Due to Bacillus Coli Communis Simulating Renal Tuberculosis. L. W. Allen, San Francisco.
66 *Gunshot Wounds of Ureter; Uretero-vesical Anastomosis. G. T. Vaughan, Washington.
67 Scabies in the United States and Canada. J. N. Hyde, Chicago.
68 X-Ray Treatment of Cutaneous Epithelioma. C. M. Williams, New York City.
69 *Acute Hemorrhagic Encephalitis. E. E. Southard and C. W. Keene, Boston.
70 Primary Splenomegaly—Gaucher Type. N. E. Brill, F. S. Mandlebaum and E. Libman, Philadelphia.
71 Suctorial and Other Insects as Plague Carriers. M. Hertzog, Chicago.

57.—See abstract in THE JOURNAL of December 24, p. 1988

62.—Ibid., of March 25, p. 980.

63. Albuminuria in Appendicitis and Hernia.—In order to determine the relationship between albuminuria and hernia and albuminuria and appendicitis Bunts studied 50 consecutive cases of each affection. His results were as follows: Appendicitis, 50 cases; of these 43 were operated on during the attack and 7 between attacks, with 2 deaths. Examination of

the urine showed albumin in 18 cases previous to operation, disappearing after operation in 5 cases. Twenty patients who had previously been free from albuminuria developed it after the operation, making a total of 33 in whom it was present subsequent to operation. Hernia (non-inflammatory), 50 cases; no deaths. Of these 11 showed albumin in the urine before operation, disappearing after operation in but 2 cases. In 11 new cases albuminuria developed after operation, making a total of 20 in whom it was then present. Thus, of the inflammatory cases, 18, or 36 per cent., had albumin before operation, while of the non-inflammatory cases only 22 per cent. had albumin; 13, or 26 per cent., of the former had it both before and after, and 18 of the latter were similarly affected. Of the former the albumin disappeared in 28 per cent. after operation, while in the latter it disappeared in 18 per cent. Although these statistics are very meager, Bunts believes that they emphasize the fact that albumin is found in a very large percentage of surgical cases; that it can not be considered on any ground yet established that it is of itself a contraindication to operation.

64. **Is Transplantation of Cord Necessary in Hernia?**—Connell recommends for the radical cure of inguinal hernia the operation in which the cord is left *in situ*. As objections to the transplantation of the cord he mentions: 1, Interference with the circulation and the function of the testes; 2, strengthening the posterior wall at the expense of the anterior; 3, the complexity of the operation and the greater possibility of infection and, 4, recurrence. He has operated on 32 cases in which the cord was not transplanted and the internal oblique was sutured to Poupart's ligament, according to the Ferguson technic. The external oblique was sutured in various ways. Fourteen patients have been traced and heard from recently; 2 have had a recurrence, but as 1 was complicated by an undescended testicle and the other was operated on for a recurrence, after a Bassini operation, Connell believes that they would not serve as arguments against the method.

66. **Gunshot Wounds of Ureter.**—In 2 cases cited, Vaughan performed ureterovesical anastomosis, an operation which is indicated whenever the lower part of the ureter has been divided or resected, and the proximal ends are long enough to reach the bladder. It is preferable to a uretero-ureteral union, because the operation is performed more easily; it is less likely to be followed by stricture, and in case a stricture does form, it is more accessible and easier to treat.

69. **Acute Hemorrhagic Encephalitis.**—A study of encephalitis due to the *Staphylococcus pyogenes aureus* was made by Southard and Keene. Three of the patients were males and 3 were females. Their ages varied from 5 to 55 years. In every case except one, in which the history was unknown, there was a history of antecedent disease. One patient was convalescing from scarlet fever; a second was five weeks recovered from diphtheria and had a chronic endocarditis of long standing; a third was under treatment for chronic urethritis; a fourth had pleurisy with effusion and was but three months beyond the menopause, and a fifth had a history of excessive use of alcohol for many years. The onset was sudden in 3 cases, with hemiparesis and unilateral convulsions in 1; chilly feelings and frontal headache followed by echimosis in a second, and malaise, manifold pains, echimoses and cerebral symptoms in the third. In another case the onset was of the fulminant type. In the remaining two cases the onset was gradual. The distribution of the brain lesions was as follows: Four cases showed areas of frank and somewhat voluminous hemorrhage, as a rule involving primarily the subcortical region. Three cases showed multiple echimoses and small abscesses of the cortex or subcortical region, with or without gross evidence of surrounding edema. In 3 cases edema of the piameter was remarked. In 2 cases there was noted a hemorrhagic effusion into the lateral ventricles, and in 2 cases in which the temporal lobe was involved the middle ears showed no lesion. The histologic picture varied from diapedesis and slight leucocyte emigration to abscess and acutely destructive hemorrhage with phagocytosis.

Colorado Medicine, Denver.

March.

72 Care of Stump in Appendicitis. R. W. Corwin, Pueblo, Colo.
73 When Not to Operate in Appendicitis. H. G. Wetherill, Denver.
74 *Complications and Sequels of Appendicitis. W. W. Grant, Denver.
75 Early Diagnosis and Treatment of Appendicitis with Personal Report from 100 Physicians Who Have Suffered from the Disease. I. B. Perkins, Denver.

74. **Complications and Sequels of Appendicitis.**—Appendicitis is classed as simple by Grant, when in the acute stage, perforation or gangrene has not occurred. Abscess, even though it is circumscribed, is a complication as well as a result. Gangrene is a common complication. He cites a case of left subdiaphragmatic abscess occurring as a sequel in a girl 7 years of age, operated on by him for a retrocolic abscess of the appendix by an incision over the most prominent part above the iliac crest and the ascending colon, with a second opening for drainage in the loin, no effort being made to find the appendix. Fourteen years later the patient fell and not long after a swelling appeared at the umbilicus and broke, discharging pus for several months. Grant believes this was an infected cholecystitis due to the former appendicitis. Just a year before the accident this patient had an abscess in the left hypogastrium, which was incised just within the anterior superior spinus process of the ileum. The opening had momentarily closed, the abscess refilled and extended from the iliac crest to the costal arch. It was opened, giving exit to a large quantity of very offensive pus. She was also expectorating freely, an offensive mucopurulent material. A diagnosis was made of abscess of the lower lobe of the left lung. This was opened and drained. Cough soon ceased and the patient made an uneventful recovery. Grant regards two phenomena as of some diagnostic significance, especially in gangrenous and suppurative cases, when the appendix is entirely in the retrocolic fossa. One, a tender point about three inches to the right of the umbilicus on a horizontal line from it, and more sensitive than the McBurney point, in these particular cases, and some two or three inches above it; the other, an infection of the glands of the neck, including the parotid. Grant also reports as complications a case of femoral thrombosis of the right leg in acute appendicitis on the second day, the man having had pulmonary tuberculosis for several years; and a case of phlebitis of a mild character, commencing in the groin, with moderate swelling in a case of acute gangrenous appendicitis. It delayed the convalescence, and for months the limbs were swollen and painful. He also cites a case of intestinal obstruction following appendicectomy due to omental strangulation of the intestine in the vicinity of an adhesion of the omentum to the middle of the appendix, which had been discovered at the time of operation. The postmortem revealed strangulation of a coil of ileum near the cecum and a kink on the transverse colon. General peritonitis, due to the colon bacillus or to the streptococcus, can be combated successfully, either at the time of operation or soon after, by free incision, breaking up adhesions, evacuating pockets of pus, cleaning the general cavity by mopping and irrigation, and then draining with gauze or tubes. In intestinal paralysis, cathartics and enemas are useless. Stomach lavage may do some good, and it should be used. The condition is best met by enterostomy and drainage, putting a tube in both ends of the intestine. If this is done before the patient is exhausted by sepsis, recovery may ensue. The so-called incarceration shock should be treated with salt infusion, adrenalin and strychnin, and abdominal section should be performed as quickly as possible. Phlebitis is treated by absolute rest and supporting measures. Pregnancy is not a contraindication to appendicectomy. For circumscribed abscess not involving the peritoneal cavity, which is protected by an adhesion wall, simple incision and drainage is the safest procedure. If the appendix is easily exposed or found it should be removed, but it is not the best surgical procedure to sever adhesions and to open the peritoneal cavity in this effort at this particular time. It is taking an unnecessary risk of infecting the peritoneal cavity. Hernia as a result of drainage can only be cured by

excision of scar tissue, by sewing the divided muscles, and by uniting the fascia well over all. On account of the danger of fat necrosis in persons who have thick abdominal walls Grant often drains the fat space. After uniting peritoneum, muscles and fascia in separate layers, the two latter with chromicized catgut, a rubber drainage tube is inserted between fascia and skin and fixed by a stitch in the lower angle of the wound. The tube is removed in three or four days and the fat continues to discharge for a few days or a week. Since resorting to this method he has never had a wound break down and there is greater security against hernia.

Wisconsin Medical Journal, Milwaukee.

February.

77 Address of President of Medical Society of Milwaukee County. G. E. Seaman, Milwaukee.
78 *Surgical Treatment of Ascites Due to Cirrhosis of the Liver. W. Mackie, Milwaukee.
79 Medical Ethics. J. L. Cleary, Kenosha.
80 Glimpse into the Past, Present and Future of Therapeutics. S. R. Moyer, Monroe, Wis.

78. **Surgical Treatment of Ascites.**—The results obtained in the cases of cirrhosis of the liver treated surgically are described by Mackie. The patient has suffered severely from ascites and swelling of the feet and the lower extremities. The left lobe of the liver was nodular, the right smooth and extending below the costal arch. There were no adhesions. A large flat piece of sterile gauze was spread over the surface of the liver as far to the right and left as possible, with the idea of producing a maximum amount of localized peritonitis and subsequent adhesions over a large area of hepatic surface to the abdominal parietes. The omentum was caught up by the sutures closing the abdominal incision, which was parallel to the outer border of the right rectus muscle. This gauze packing was removed after forty-eight hours. During the next six months the patient had to be tapped twice, after which no fluid could be detected in the abdominal cavity and the urine was free from albumin. A capit medusæ which had formed and caused her considerable trouble gradually diminished in size. During all this time iodid of potash had been given, with saline cathartics at intervals. Two years after the operation the patient was still well and had not been troubled with ascites.

Journal of Medicine and Science, Portland, Me.

February.

81 Proprietaries in Present Day Prescriptions. W. S. Jackman, Orono.
82 The Conditions of Pharmacy in the State of Maine. F. H. Wilson, Brunswick.
83 Some Advantages of the Metric System. W. H. Kimball, Portland.

Virginia Medical Semi-Monthly, Richmond.

February 24.

84 Mastoiditis. W. F. Mercer, Richmond.
85 Sarcoma of Cervix Uteri. J. E. Phillips, Suffolk, Va.
86 Some of My Mistakes in Obstetric Practice. J. T. Graham, Wytheville, Va.
87 Condum Used to Stop Bleeding Nose. W. W. Wilkinson, La Crosse, Va.
88 A Plea for the Early Treatment of Strabismus. O. Wilkinson, Washington, D. C.
89 Symptoms and Diagnosis of Cancer of the Stomach. H. S. MacLean, Richmond.
90 Water—Its Uses and Its Dangers in Medicine. W. H. Wallace, Disputanta, Va.

Dominion Medical Monthly, Toronto.

February.

91 A Case of General Infection by the Staphylococcus Pyogenes Aureus, Streptococcus Pyogenes and Pneumococcus, with a Remarkable Sequence of Clinical Manifestations. H. B. Anderson, Toronto.
92 The Vomiting of Pregnancy. S. J. Elkin, Winnipeg.

Kansas City Medical Record, Kansas City.

February.

93 The Surgical Treatment of Goiter. E. von Quast, Kansas City.
94 Lack of Development a Cause of Disease. M. G. Roberts, Lamar, Mo.

Southern Medicine and Surgery, Chattanooga.

February.

95 The Treatment of Lobar Pneumonia. G. R. Butler, Brooklyn, N. Y.
96 Facts and Fallacies in Gastrointestinal Work. L. Amster, Atlanta, Ga.
97 President's Address. Pure Food and Drug Legislation. F. B. Sloan, Cowan, Tenn.
98 Reinforcement of Weakened Immunity, in Lymphatic Tuberculosis, with the Toxins of Tubercle Bacilli. J. R. Briggs, Dallas, Tex.
99 Some Popular Medical Fallacies. J. M. Kennedy, Knoxville, Tenn.

Texas Medical Journal, Austin.

February.

100 Chronic Gastritis. J. R. Hunter, Hornsby, Texas.
101 Digitalis and Veratrum in the Treatment of Pneumonia. J. W. Carhart, Austin.

Columbus Medical Journal, Columbus, Ohio.

February.

101½ "Angina Pectoris." H. M. Hazleton, Lancaster, Ohio.
102 Special Topography of the Ureter and Tractus Nervosa. B. Robinson, Chicago.
103 Lungs in Health and Disease—More Particularly the Vesicular Murmur. W. N. Unkefer, Piqua, Ohio.
104 Antitubercular Dispensaries. L. G. De La Mache, Columbus, Ohio.

Southern California Practitioner, Los Angeles.

February.

105 Cholelithiasis. W. W. Beckett, Los Angeles.
106 Mediastinal Tumor. W. P. Millspaugh, Los Angeles.
107 Sarcoma of the Choroid. A. C. Rogers, Los Angeles.

Oklahoma Medical News-Journal, Oklahoma City.

February.

108 The Hodgen Splint. J. A. Matlock, Galesburg, Ill.
109 Stammering and Stuttering. J. M. Brown, Chicago.
110 The Surgeon's Assistant. F. H. Clark, El Reno, Okla.

Western Medical Review, Lincoln, Neb.

February.

111 Report of a Case of Purpura Hemorrhagica Subacute. E. Tanner, Battle Creek, Neb.
112 When to Operate on Fibroid Tumors of the Uterus. C. O. Rich, Omaha, Neb.
113 Neglected Cases. D. W. Beattie, Neligh, Neb.
114 Primary Carcinoma of the Nasal Septum. E. A. Beard, Stanton, Neb.
115 The Necessity of Combination for Mutual Benefit. J. H. Mackay, Norfolk, Neb.

Medical Fortnightly, St. Louis.

February 25.

116 Nature and Treatment of Diarrhea. R. B. Darnley, Philadelphia.
117 Case of Acute Miliary Tuberculosis with Postmortem Findings. H. A. Potts, Jacksonville, Ill.

Canadian Journal of Medicine and Surgery, Toronto.

March.

119 Case of Multiple Neuritis with Ataxia Simulating Tabes Dorsalis; Recovery. C. Meyers, London.
120 Medical Men and the New Provinces. J. Hunter.

Medical Examiner and Practitioner, New York.

January.

121 Some Urological Problems Encountered by the Medical Examiner. J. Allen Paton, Chicago.
122 The Indication of an Intermittent or an Irregular Pulse in Relation to Life Examinations. A. B. Hirsch, Philadelphia.
123 The Significance of the Cardio-Pulmonic Murmur. G. D. Morton, Philadelphia.
124 The Importance of Accentuation of the Second Pulmonic Sound. T. J. Mays, Philadelphia.
125 Gynecologic Diagnosis in Relation to Life Insurance. W. Krusen, Philadelphia.
126 Macroscopic Appearance of Urine in Relation to Life Insurance. H. M. Christian, Philadelphia.
127 Hypertrophied Prostate. R. L. Loux, Chillicothe, Ohio.
128 Diseases of the Rectum in Relation to Life Insurance. J. C. Brick, Philadelphia.
129 Insanity and Epilepsy in Relation to Life Assurance. W. R. Gowers, London.

FOREIGN.

Titles marked with an asterisk (*) are abstracted below. Clinical lectures, single case reports and trials of new drugs and artificial foods are omitted unless of exceptional general interest.

British Medical Journal, London.

March 4.

1 *Prospects and Vicissitudes of Appendicitis After Operations. F. Treves, London.
2 Some Peculiarities of Appendicitis in the Female Sex, with Special Reference to Appendicitis Occurring During Pregnancy. G. Heaton, Birmingham.
3 Relationships Between Colitis and Appendicitis from a Surgical Point of View. C. B. Lockwood.
4 Operative Treatment of Certain Severe Cases of Indigestion. W. B. Clarke.

1. **Appendicitis After Operation.**—The degree of imperfect relief or of imperfect recovery after operation, and the complications which may attend operation and which may be re-

garded as accidental or independent of a direct surgical result of the case after appendicectomy are the subjects considered by Treves. In 45 patients examined by Treves, and who complained that they were no better for the operation which had been performed in the quiescent period, the findings were as follows: Appendix imperfectly removed, 2 cases; ovarian trouble coexisting, 9 cases; persisting or relapsing colitis, 8 cases; persisting local pain, 7 cases; neurasthenia or hypochondriasis, 5 cases; continued attacks due to gallstones, 3 cases; due to colic, 2 cases; due to movable kidney, 2 cases; due to renal calculus, 1 case; an unexplained cause, 1 case, and a tender mass in the right iliac fossa, 5 cases. The following imperfect results may follow the evacuation of a perityphlitic abscess: Persistent sinuses, 40 per cent.; recurring abscesses, 24 per cent.; recurring attacks of appendicitis, 16 per cent.; fecal fistulæ, 12 per cent.; inflammatory deposits in the iliac fossa, 8 per cent. Treves considers these figures of little value, as they do not represent the experience in practice of any one surgeon. Although Treves is of the opinion that the appendix should be removed in any case in which the least trouble is experienced, yet, he says, the following arguments may be urged against the establishment of the rule that in every case of abscess (in which the appendix has not been removed) it should be excised at the first convenient opportunity: 1. The most liberal estimate shows that 83 patients out of every 100 will never have another attack. 2. The risk of a second attack is comparatively small. 3. In those cases in which an abscess has formed, although the operation is often easy, it is frequently not only very difficult but distinctly dangerous. 4. The evidence that an abscess has burst into the bowel is not always conclusive. The discharge may be decomposed and long retained mucus. The following complications were met with in a series of 1,000 cases: Fecal fistula, 49 cases; thrombosis of the femoral vein, 12 cases; intestinal obstruction, 10 cases; bronchopneumonia, 17 cases; pleurisy with effusion, 14 cases; without effusion, 2 cases; empyema, 7 cases; acute bronchitis, 4 cases; pulmonary embolism, 1 case; non-suppurative parotitis, 4 cases; pylephlebitis, 4 cases; residual abscess, 11 cases; secondary abscess, 12 cases. In 6 of the 1,000 cases the appendicitis was associated with pregnancy. Of the total number of cases (1,000) 684 were males and 316 were females. Operation was performed during the quiescent period on 364, 4 resulting fatally. In cases with local peritonitis but no pus, 39 operations were performed, with 5 deaths; in cases with abscess, 431 operations, with 35 deaths; in cases of general peritonitis, with or without abscess, 166 operations, with 127 deaths. Of 264 cases of abscess or of general peritonitis further attacks were complained of in 27 cases, or 10.2 per cent. Of 242 cases of operation during the quiescent period, further attacks were complained of in 4.5 per cent. Of 107 cases of abscess or of general peritonitis, in which the appendix was said to have been removed, only 6 complained of further attacks. In 122 cases in which the appendix was not removed 21 patients complained of further attacks.

The Lancet, London.

March 4.

5 Changes Produced by Inflammation in the Conjunctiva. M. S. Mayou.
6 Peritonitis, a Bacteriologic Study. L. S. Dudgeon and P. W. G. Sargent.
7 Plastic Surgery. C. R. R. Keetley, London.
8 Treatment of Severe Curvatures in the Tibia by Means of Manual Osteoclasis. T. H. Openshaw, London.
9 Cause of Pain in Cases of Gastric Ulcer and Its Bearing on the Operation of Gastrojejunostomy. C. W. M. Moullin, London.
10 Case of Recurrent or Successive Ovarian Papilloma with Sequent Ventral Hernia, Followed by Cervical Epithelioma; Two Abdominal Celiotomies; Operation for Ventral Hernia; Vaginal Hysterectomy; Recovery. E. S. Bishop, Manchester.

The Dublin Journal of Medical Science.

March.

11 A Case of Chronic Lymphaemia. E. J. McWeeney.
12 The Principal Results of the Census of the United Kingdom in 1901. R. E. Matheson.
13 Notes on Chinese Medicine. Samuel Synge.
14 Course and Treatment of a Case of Chorea Insaniens Associated with Pregnancy. J. Francis Dixon.
15 Sicily as a Winter Health Resort. E. Parlato.

Practitioner, London.

February.

18 Interlobar Empyema. Wm. Broadbent.
19 A Slipping Cartilage in the Knee Joint. Edmund Owen.
20 *Effect of Raw Meat on the Nitrogen Metabolism in Pulmonary Tuberculosis. "Zomotherapy." J. J. Galbraith Edinburgh.
21 Some Points in the Surgical Treatment of Intestinal Obstruction. (Concluded.) T. Carwardine.
22 Some Affections of the Cervical Sympathetic. Purves Stewart.
23 Case of Localized Empyema Associated with the Presence of Leptothrix. Paul Mathews.
24 Ethyl Chlorid as an Anesthetic in General Practice. Harvey Hilliard.
25 *Rheumatoid Arthritis; Some Observations on Its Treatment. John Orr.
26 Some Recent Work in Diseases of Children. George F. Still.
27 Review of Recent Work on Dental Surgery. Oral Sepsis. J. G. Turner.

20. **Effect of Raw Meat on Nitrogen Metabolism in Tuberculosis.**—The experiments conducted by Galbraith tend to show that cooking materially affects both the absorption and retention of nitrogen, in the physiologic as well as in the tuberculous subject. While the total quantity of nitrogen present in the feces on a diet of raw meat is increased, that increase is due entirely to the presence of collagen; the soluble and digestible nitrogen is actually diminished. Gelatin has been shown to be by itself incapable of sustaining nitrogen equilibrium. The chief points of interest are that raw meat causes an increased retention of nitrogen, even with a diminished intake, and it also causes an improvement in intestinal metabolism, manifesting itself in the form of a diminution of the nitrogen in the feces. Digestive leucocytosis is invariably larger on a diet of raw meat than on a diet of cooked meat. This may be corelated with the increased nitrogen retention, on the supposition that the digestive leucocytosis is the evidence of a functional activity on the part of the leucocyte, the object of the activity being the secretion of a body to link the absorbed nitrogen onto the tissue cells.

25. **Rheumatoid Arthritis.**—Orr speaks in favor of the treatment instituted by Balfour in 1893. Since that time he has treated a considerable number of patients in various stages of the disease, and no treatment compares in successful results with Balfour's. In many cases a considerable amount of good can be done in the way of alleviating suffering, preventing deformity and restoring the use of the limbs, and in some cases a cure is effected. The treatment consists of dieting, internal medication (the administration of arsenic and iron in small doses for a period of three weeks out of every month) and counter-irritation carried out by the employment of blisters. He advises continuing the treatment for two, three or more years, according to the extent and severity of the disease.

Revue de Chirurgie, Paris.

Last indexed page 832.

28 *(XXV, No. 2.) Traitement opératoire des ruptures sus-rotuliennes du quadriceps. E. Quénu and P. Duval.
29 *Le traitement rationnel des luxations congénitales de la hanche (hip). Etude théorique. P. le Damany (Rennes). (Commenced in No. 1.)
30 *L'oesophagotomie externe cervicale comme traitement des corps etrangers de l'eosophage (for removal of foreign bodies) Balacesco and Cohn. (Commenced in XXX, Nos. 9-10.)

28. **Rupture of Quadriceps Above the Knee.**—In 22 cases of suprapatellar rupture of the quadriceps the muscle was sutured. The reports of the various operations are summarized by Quénu; the results were good in every instance. Comparison with the results in the non-sutured cases shows the great superiority of this method of treatment. The list of cases operated on includes 3 from Quénu's own experience. He does not operate at once, preferring to wait until the integument can be made aseptic. He applies moist compresses to soften the epidermis, and makes the toilet of the knee with great care every day, using a weak solution of soda, then ether and alcohol. He insists that aseptic precautions should be even more particular than for a laparotomy, as the synovial membrane is unable to protect itself like the peritoneum, and, besides, it is in an abnormal condition from the traumatism causing the rupture. Gloves are indispensable. Even when the surgeon is not summoned until late in the case the results are good. Silver wire is used for the suture. The vertical sutures should be reinforced by sutures passed across the stumps of the muscle from side to side, as is shown in the illustrations.

29. **Rational Treatment of Congenital Dislocation of the Hip.**—Le Damany's report of his extensive theoretical and clinical study of this subject is accompanied by 32 illustrations or diagrams. He shows the mechanism by which the orthopedist can imitate nature and restore conditions to normal. In the best shaped child, he remarks, the hollow of the acetabulum becomes partially filled up during the last months of intrauterine life, but becomes hollowed out again after birth by the pressure of the head of the femur. In treating dislocation if the femur can be held in the proper position, allowing the weight to be borne on it as in normal conditions, the same result will be attained in time in the atrophied acetabulum. The femur is twisted during intrauterine life, but becomes untwisted after birth by the mechanism which we readily understand. In congenital dislocation we apply the same forces or similar ones as in this mechanism, but in such conditions that the dislocation can not reproduce itself. We thus untwist the femur. In case of simple dislocation the excess of slant in front of the acetabulum will correct itself by the asymmetry of the weight of the body, but in the double form the entire correction has to be made by untwisting the femur. As soon as this correction becomes sufficient, the dislocation is cured once and for all.

30. **External Cervical Esophagotomy for Foreign Bodies.**—Balacesco and Cohn report from Jonnesco's clinic at Bucharest 6 new cases of this operation, and epitomize the literature on the subject. They find 320 cases of the kind on record since 1738. France leads with 63; England and Germany follow with 55; North America with 49; Russia with 43, and Austria with 23. None of the 11 other countries mentioned report over 9. The age ranged from 6 months to 100 years. False teeth, bones and coins were the most frequent objects that had been swallowed. The mortality during the last three years in 55 operations has been only 12.6 per cent. The mortality from bones and stones was respectively 27.8 and 33.3 per cent., while from coins it was only 11.1 per cent. The deaths were almost always due to injuries from the long sojourn of the foreign body in the esophagus. The importance of having artificial teeth made in such a way that they can not be readily swallowed should be impressed on dentists, as these objects are the most dangerous of all foreign bodies in the esophagus according to the statistics, forming a large percentage of the 10 cases of fatal hemorrhage.

Beiträge z. klin. Chirurgie, von Bruns', Tübingen.

Last indexed page 664.

31 (XLIV, No. 2.) Ueber subkutane Sehnenscheiden-Hämatome (of tendon sheaths). H. Kuttner.
32 Lupous Mutilation of Fingers and Toes.—Ueber die lupöse Verkrüppelung und Verstümmelung der Finger und Zehen. G. Mingramm.
33 Cysticercus cellulosæ im Muskel. W. Danielsen.
34 Beiträge zur Statistik der Hasenscharten (harelip). G. Haug.
35 *Remote Results of Ligation of Saphena in Treatment of Varices.—Ueber die Dauerresultate der Saphenaunterbindung bei der Behandlung der Varizen. M. Goerlich.
36 *Fibrous Tumors of Abdominal Wall.—Desmoide der Bauchdecken und ihre Prognose. C. Pfeiffer.
37 Zur operativen Behandlung der Prostata-Hypertrophie. G. E. Münnich.
38 Congenital High Shoulder.—Ueber angeborenen Schulterhochstand. O. Ehrhardt.
39 Ueber das Aneurysma der Art. axillaris infolge von Schulterverrenkung (consecutive to dislocation of shoulder). G. Schmidt.

35. **Remote Results of Ligation of Varicose Saphena.**—During the last twelve years 108 cases of varices have been treated at Tübingen by ligation of the saphena. In 23 the right leg was alone involved, in 29 the left, and in the others, both legs. Fifty-one of the patients were examined at a later period and reports were obtained from 29 others. The results have been satisfactory in 87 per cent. of the cases. The varices had recurred in a number, pronounced in 9, medium in 41, and slight in 19. The circulation through the resected saphena became restored after 42 of the operations. Ligation alone gave only 21 per cent. of successful results, while resection gave 78.9 per cent. The best results were attained when the vein was ligated just below its mouth, and a long stretch of the vein was resected.

36. **Fibroids of Abdominal Walls.**—Pfeiffer writes of the history and present status of our knowledge of the fibrous tumors that develop from the muscles and aponeuroses of the abdominal walls. About 40 have been observed at Tübingen and he has collected 360 from the literature. All but 12.9 per cent. were in women. Three-fourths were in the right side. More than 30 per cent. of the cases developed recurrence after operation, fatal in one-half the cases of recurrence. Spontaneous retrogression has never been observed. Dangerous complications are liable to develop, and internal and local treatment has never proved effectual. Consequently prompt removal is the only choice. As a pedicle may be found, the peritoneum may have to be opened. The primary mortality of these tumors has been 4.5 per cent. (3.05 per cent. when the abdominal cavity was entered and 1.05 per cent. without). The remote results have been permanent cures in 90 per cent. of the female cases and scarcely 50 per cent. in the males.

Berliner klinische Wochenschrift.

Last indexed pages 912 and 992.

40 (XLII, No. 6, February 6.) *Significance of Syphilis of Liver for Diagnosis of Abdominal Tumors.—Die Bedeutung der Lebersyphilis für die Diagnose der Bauchgeschwülste. König.
41 Origin of Immunity to Typhoid.—Entstehung der Typhusimmunität. Jürgens.
42 Secretion of Gastric Juice in Herbivorous Animals.—Experimentelle Untersuchungen über die Magensaftsekretion bei den Herbivoren. A. Bickel.
43 Fall von Pyodermite végétante. R. Ledermann.
44 Adrenalin Gauze Made by Patented Process.—Ein neues Verfahren der Blutstillung. B. Müller (Hamburg).
45 Ueber Verrenkungen und Verrenkungsbrüche im Talocrural-Gelenk (sprains and fractures). Pels-Leusden.
46 Importance of Late Attempts to Transmit Syphilis to Animals.—Bedeutung der neueren Versuche, Syphilis auf Tiere zu übertragen. E. Hoffmann.
47 Prothesis for Speaking and Swallowing After Removal of Larynx and Esophagus.—Eine Sprech- und Schluckprothese für den Defekt des Kehlkopfs und der Speiseröhre.
48 (No. 7) *Misuse of Tendon Plastics.—Ueber Missbrauch der Sehnen-Transplantation. H. Oppenheim.
49 Zur Kasuistik der Keratomykosis aspergillina. Osterroht.
50 Palpation des Appendix und über die Appendicitis larvata. T. Hausmann.
51 Ueber Osteomyelitis im Säuglingsalter (in infancy). H. Mohr.
52 Etwas über physikalische Herz-Diagnostik (of heart). de la Camp.
53 *Tamponing Nose and Rhinopharynx.—Zur Tamponade der Nase und des Nasenrachenraumes. G. Lennhoff.

40. **Differentiation of Syphilitic from Other Tumors of the Liver.**—König remarks that physicians are gradually awakening to the knowledge that affections of internal organs—even when they appear in the guise of functional disturbances or of febrile inflammatory processes—may be traceable to syphilis. A syphilitic affection in some viscus may develop suddenly in the midst of apparent health, in persons free from the slightest apparent indication or history of syphilis. Three cases are described to illustrate the principal types which syphilis of the liver is liable to assume. The patients had suffered for a longer or shorter time—two years in one case—from attacks of pain in the liver region. There were no actual functional disturbances, but loss of appetite and weight. The localization of the pains led to detection of a tumor in the liver region. In one case—the patient, a woman of 28—the tumor was large and movable, under the right half of the liver with which it was apparently connected, extending backward toward the kidney region. The laparatomy disclosed that the tumor was formed of part of the liver, separated from the rest by a furrow, the surface studded with round grayish-white foci which extended also over the rest of the liver. As the liver and stomach were firmly adherent, a carcinoma in the stomach was assumed to be the primary focus for the "multiple metastatic liver carcinosis." The abdomen was sutured and mercurial inunctions with potassium iodid were commenced. The patient rapidly recovered and has been healthy to date (since 1901.) No history of syphilis could be ascertained. In the case of a woman of 39 who had borne 4 normal children, a painful tumor developed in the right hypochondrium, without functional liver disturbances, but otherwise simulating cancer of the gall bladder. The laparotomy disclosed an unmistakable gummatous tumor in the lower edge of the partially cirrhotic

liver. The tumor was as large as an apple, and was excised into sound tissue. Nothing suggesting syphilis could be ascertained in this case either. The third patient was a young man of 22 who denied syphilitic history. The pains were severe and referred to the stomach, radiating thence to the right hypochondrium. Gastric disturbances had been complained of for some years. A flat, hard tumor gradually developed in the right hypochondrium, and the left lobe of the liver was found at the laparotomy studded throughout with numerous gummata. Examination of the eyes later confirmed the assumption of congenital syphilis. A syphilitic tumor of the liver does not seem to have any special characteristics. The pains may develop long before the discovery of a tumor. The attacks of pain are generally associated with stomach disturbances, loss of appetite or even vomiting. There was no effusion into the abdominal cavity, although this has been observed in some instances. The tumor may lie within the liver substance; it is generally hard and uneven and inside the liver percussion area, or it may be a very movable, kidney-shaped tumor, apparently separate from the liver but connected with it by a pedicle. This variety simulates a gall-bladder tumor, movable kidney or "corset" liver. A remarkable feature of one of the cases reported was that antisyphilitic treatment had proved ineffectual before the laparotomy, but afterward it displayed its usual efficiency. Even when the abdomen has been opened carcinosis or tuberculosis may be suggested by the aspect of the lesions. An exploratory excision is a great help in dubious cases. When syphilis has been established the question whether or not to excise the lesion must be decided by the individual circumstances.

48. **Abuse of Plastic Operations on Tendons.**—Oppenheim warns surgeons emphatically against attempting any tendon operation unless sure that the case is one in which the affection requiring treatment has run its course and is not a progressive one. He has witnessed three typical examples of the harm that can be done by such procedures in case of progressive muscular atrophy, chronic anterior poliomyelitis or a spinal tumor. The course of these progressive affections was hastened and much harm was done by tendon transplantation undertaken to relieve conditions at some stage of the affection. The operation itself, the consecutive immobilization and other measures are serious matters for a person with nerves or muscles or both in abnormal condition.

53. **Tampon for Nose and Nasopharynx.**—Lennhof uses a long narrow strip of gauze, folded back and forth on itself, with a stout silk thread passed through it and knotted at one end. This end of the strip, with the knot, is introduced through the nose into the nasopharynx. An assistant holds the other end of the string, and the strip of gauze, thus under control, is readily packed into the nose. Pulling on the string tightens the folds of the strip into a solid tampon. The advantages are obvious. Not the least is the fact that the tampon is removed gradually in the form of a strip.

Centralblatt f. Chirurgie, Leipsic.

Last indexed page 993.

54 (XXXII, No. 8, February 25.) Fenestrated Sound for Goiter Operations.—Die gefensterte Kropfsonde. F. Brunner.
55 (No. 9.) *Modifikation der Bassini'schen Radikal Operation der Leistenbruche (hernia). E. A. Polya (Budapest).

55. **Modification of Bassini's Operation for Inguinal Hernia.**—In von Herczel's surgical service at Budapest a modified Bassini operation is preferred to the original technic as affording better protection against recurrence and against nutritional disturbances in the testicle. Polya illustrates the essential features of the modified technic, showing how the spermatic cord is first drawn upward as it emerges from the muscles, traction being exerted by a spur from the aponeurosis of the oblique. The cord is thus drawn first inward, then up, and then around on the other side of the incision, where it passes along a new canal formed in the aponeurosis, which folds up close around the cord. The Bassini suture is reinforced by suturing the upper flap of the aponeurosis to Poupart's ligament.

Centralblatt f. Gynäkologie, Leipsic.

Last indexed page 993.

56 (XXIX, No. 8, February 25.) Paralyse des nicht schwangeren Uterus (of non-gravid uterus). R. Kossmann.
57 *Patient's Consent to an Operation.—"Ueber die Einwilligung der Kranken zu Operationen." A. Dührssen.
58 "Der suboccipito-frontale Kopfumfang" (circumference of head). G. Burckhard.
59 Hebelhalter für Irrigatoren (adjustable lever holder). C. H. Stratz.
60 (No. 9.) Proliferation of Lutein Cells in Imperforate Follicles.—Die Luteinzellenwucherung in atretischen Follikeln eine physiologische Erscheinung wahrend der Gravidität. L. Seitz.
61 *Ueber Uterus-Ruptur. A. v. Valenta.

57. **Patient's Consent to an Operation.**—Dührssen comments on a damage suit brought against him in 1902 which is still hanging in the courts. He advocates the use of a printed form, dated and signed by the patient, expressing her agreement with the measures deemed appropriate for the cure of her affection in the clinic mentioned by name.

61. **Rupture of the Uterus.**—Valenta has had occasion to observe 14 cases of complete rupture of the uterus among 1,350 parturients. He gives the particulars of 2 cases in which the patients were saved by prompt operating. Eight of the women were operated on and 3 recovered, that is, 37.5 per cent., while all of the patients unoperated on died. The sooner after the rupture the operation is undertaken the better the outcome. The results would have been better in his cases if he could have gained the patients' consent to an operation earlier. Hours were wasted on this account in some instances, and 3 women succumbed without allowing any operation to be performed. He advocates supravaginal amputation and extraperitoneal care of the stump as the safest and surest method of treating complete rupture of the uterus. He tabulates the 14 cases with 2 additional, incomplete ruptures.

Deutsche medizinische Wochenschrift, Berlin and Leipsic.

62 (XXXI, No. 5, January 31.) *Treatment of Hemorrhage from the Lungs.—Die Behandlung der Lungenblutungen. H. Hochhaus.
63 *Zur Prognose des Diabetes. F. Hirschfield.
64 Thiosinamin bei Narbenkontrakturen (in treatment of cicatrical contracture). Mellin.
65 Unterbindung der Arteria hypogastrica dextra wegen Aneurysma der Arteria glutea inferior (ligation, one case). C. Israel.
66 *Rotary Punch for Epilation.—Eine neue sichere Epilations Methode: das Stanzen. Kromayer.
67 Immunization of Cattle Against Tuberculosis and Trials of Turtle Serum.—Ueber Immunisierung von Rindern gegen Tuberculose (Perlsucht) und über Tuberculose Serumversuche. Libbertz and Ruppel. Reply. F. F. Friedmann.
68 Pleuritis with Muscular Rheumatism.—Brustfellentzundung und Muskelrheumatismus. A. Kirchner.
69 *New Year Address.—Eine Neujahrsbetrachtung. V. F. Kraus.
70 Educational Influence of Medical Inspection of Schools. Schularztliche Padagogik. Axmann.
71 (No. 6.) Ueber Ileus (clinical lecture). V. Czerny.
72 *Biologic Differentiation of Blood of Allied Species.—Zur Differenzierung des Blutes (Eiweis) biologisch verwandter Tierspecies. H. J. Hamburger.
73 Biologic Tests of Material from Mummies.—Bestimmung der Herkunft von Mumienmaterial mit Hilfe spezifischer Sera. Uhlenhuth (Greifswald).
74 *Functional Test of Heart.—Eine Funktionsprufung des kranken Herzens. M. Herz.
75 *Metabolism in Cancer Subjects.—Stoffwechseluntersuchungen bei Carcinomatösen. C. Lewin.
76 *Behandlung des akuten Schnupfens (coryza). A. Henle.
77 Epithelial Changes in Infantile Gastrointestinal Affections.—Zur Frage der epithelialen Veränderungen bei den Magendarmkrankheiten des Säuglings. G. Tugendreich.
78 *Prognose des Trismus, Tetanus neonatorum und infantium, mit Berücksichtigung der Serotherapie. H. Flesch. (Commenced in No. 5.)

62. **Treatment of Hemoptysis.**—Besides the usual rest for both body and mind, no food except cool drinks or soups, and small scraps of ice during the first few hours, with an ice-bag to the lung or a compressing bandage, Hochhaus advocates subcutaneous injection of gelatin. His experience has shown it to be very valuable. He warns against morphin or anything of the kind, unless to relieve a distressing desire to cough. Another valuable adjuvant is constriction of the limbs. The constriction is applied loosely enough to permit the influx of arterial blood but not the efflux of the venous blood. This holds the blood in the limbs and thus reduces the blood pressure in the lungs. Operative treatment should be considered as a last resource when all other measures fail.

63. **Prognosis of Diabetes.**—Hirschfeld comments on the comparative rarity of tuberculosis in diabetics. He has encoun-

tered the combination only among the severer cases in unhygienic conditions. The life expectancy does not seem to be affected by mild diabetes, that is, the cases which eliminate no more than .5 to .6 per cent. sugar in 1.5 liters of urine after ingestion of 100 gm. carbohydrates. The prognosis in really mild cases of diabetes is just as good as in cases of alimentary glycosuria. He is convinced that when the diabetes is recognized early and appropriate measures are instituted and perseveringly kept up, it remains a mild affection without much influence on the life expectancy. The cases in which from 20 to 50 gm. of sugar are eliminated after ingestion of 100 gm. of carbohydrates can not be called mild cases. The injurious action of the sugar becomes manifest in the development of nephritis. These patients are generally between 50 and 55 years of age, and are inclined to polyuria, corpulence and abuse of alcohol. In these moderately severe cases the danger of arteriosclerosis and of heart weakness is greater than otherwise corresponds to the age. Further aggravation of the diabetic symptom complex and of transition to the severer form with diabetic coma are especially liable to occur in younger subjects on an abundant carbohydrate diet. The mortality in the mild cases of glycosuria is generally due to intercurrent affections which have nothing to do with the diabetes.

66. **Rotary Punch for Epilation, Etc.**—Kromayer has devised a knife in the shape of a small, long, rotating cylinder, driven by a pedal or motor. He has found it extremely useful for removal of superfluous hairs. It fits into the skin like a sharp punch, and cuts out a long, round plug. Each superfluous hair is punched out separately, leaving a minute, round, deep cavity. The hole is so small that it heals without leaving a perceptible trace. The region is first shaved, then the hairs are stained with henna which colors the hairs only. The cylindrical knife is inserted slanting, parallel to the course of the hair. The pain is very slight, scarcely more than that of the prick of a needle, but ethyl chlorid may be used when wished. Epilation by this means is a simple, rapid process; from 100 to 200 or even 300 hairs can be thus punched out at a single sitting. There is never any recurrence of the hairs if the punched-out plug includes the entire follicle. The cylindrical knives are from .7 to 1.2 mm. in diameter. They cut through the cutis into the loose, subcutaneous tissue, so that the plug comes out with the knife or is easily pulled out with pincers.

69. **Medical Progress in 1904.**—Kraus remarks that the essential progress in medicine during the last year was in the line of perfecting that dating from the years just preceding. Recent progress in physics, chemistry and microscopy has given the medical profession a wealth of knowledge which it does not yet know how to utilize. The internists are like parvenus who do not know what to do with their newly acquired riches. He added that it was Galvani's laboratory drudge who noticed the contractions of the muscles of the frog during Galvani's experiments. Galvani himself did not notice the contractions, but when the attendant called his notice to them he recognized their importance and was able to deduce scientific laws from them. The quacks, the irregulars of all kinds, even the faith curers, may make discoveries like that laboratory drudge. We must be the Galvanis to appreciate their significance. Many a fine laboratory of the present day is in the hands of "laboratory attendants." The Galvanis are few and far between.

72. **Biologic Test of Blood from Animals of Allied Species.**—Hamburger found that injection of rabbits with serum from closely allied animals gave a more pronounced reaction in the biologic test when blood from a corresponding animal was investigated. Inoculation with serum from the goat, sheep and ox enabled the samples of blood from these various animals to be differentiated.

74. **Functional Test of Heart.**—Herz orders the patient to bend his forearm and to straighten it again, concentrating his attention on the movement to do it as slowly as it can possibly be done. The pulse is counted before and afterward. There is no variation in the pulse when the heart is sound. The patient's elbow rests on the physician's left hand, and the latter holds the wrist lightly in his other hand, but not exerting any pressure to make the movement a passive one. The muscular exertion is minimal, and the effect is due to a kind of self-inhibition (*Selbsthemmungsbewegung*) which retards the pulse to a remarkable extent when the heart is abnormal in any way. This "S test" sometimes reveals a morbid condition of the heart before any other clinical symptom becomes apparent, especially in case of constitutional disease or of chronic intoxication. In a case of diabetes and in one of tobacco poisoning cardiac disturbance was disclosed by this test at a time when nothing else indicated it. The further course of the heart trouble confirmed this diagnosis. In extreme corpulence the test was positive when the heart was diseased, but not when the disturbance was merely mechanical. It also allows cardiac asthma to be differentiated from the bronchial. Affections of the aortic valves give an especially marked reaction to the test. The concentration of the attention on the test must act on the heart through the central nervous system. Like digitalis, it has no action on the sound heart.

75. **Metabolism in Cancer.**—Lewin tabulates the findings in 11 cases of cancer. They show that the elimination of the mineral salts is abnormally high in case of cancer, the same as in tuberculosis. He adopts Robin's term of "demineralization" to express this condition. It is not specific to any affection as it occurs in various morbid conditions, but it leads to cachexia. The aromatic substances in the urine are increased in cachexia, probably from decomposition of albumin under toxic influences.

76. **Treatment of Acute Coryza.**—Henle found great relief at the onset of a severe cold in the head from the application of Bier's constriction to the neck. The bandage around the neck does not have to be drawn very tight: 25 mm. Hg is ample pressure for the purpose. The hyperemia thus induced in the head speedily banished the tickling in the nose and the sense of oppression and lachrymation so that the "cold" was aborted in half a day. This experience was corroborated in 5 clinical cases. The procedure proved a failure in another, more chronic case. All the rest were completely cured in half a day of their acute coryza without sequelæ.

78. **Prognosis of Tetanus.**—Flesch describes the details of 7 instructive cases of tetanus. He insists that the prognosis for children is much better than for adults, and that tetanus of the newly born is not so fatal as is generally assumed. The mortality of tetanus treated with serum is 15 to 20 per cent. among children. In compiling statistics he urges that a discrimination should be made between tetanus of the newly born, tetanus in children and tetanus in adults. The results of serum treatment of these various groups should also be studied and published separately.

Deutsche Zeitschrift f. Chirurgie, Leipsic.

Last indexed page 509.

79 (LXXV, Nos. 2-4.) Ueber Epithel-Veränderungen in der senilen weiblichen Mamma. A. Tietze.

80 *Effect of Extensive Resections of Skull and Dura on Structure and Function of Cortex.—Ueber die Wirkungen grosser Resektionen des Schädels und der harten Hirnhaut auf die Struktur und Funktion der Hirnrinde. O. Schifone (Durante's clinic, Rome).

81 Ueber die Lipomatosis des Hypopharynx (Cavum pharyngolaryngeum), ihre Beziehung zu den sogen. Oesophagus-Polypen und den tiefgelegenen Halslipomen. C. Goebel.

82 Ueber subperiostale Fracturen, ihre klinische Diagnose und Erkennung im Röntgenbilde. Hennig (Kiel).

83 Totale Exstirpation des Omentum bei Achsendrehung desselben (axial torsion). N. Trinkler (Kharkov).

84 Ein Beitrag zur Entstehung der perihernlösen Phlegmone. A. Martina.

85 Changes in Tissues After Mosetig's Iodoform Filling of Bone Cavities.—Ueber die geweblichen Veränderungen nach Plombierung von Knochenhöhlen. M. Silbermark.

86 Ueber plastichen Knochenersatz bei der Heilung der Spina ventosa und über die Enderfolge (remote results of bone plastics for spina ventosa). V. Schmieden.

87 Weitere Untersuchungen über die Vereiterung tuberculöser Gewebe (suppuration of tuberculous tissue). W. v. Brun.

88 Experimentelle Beiträge zur Anatomie und Pathologie des Gelenkknorpels (articular cartilage). R. Seggel.

89 Die operative Behandlung des Stauungs-Ascites durch Herstellung eines Collateral-Kreislaufs (Talmasche Operation). H. Grisson (Hamburg). Autopsy two years after Talma operation.

80. **Action of Extensive Resection of Skull and Dura on Functions of Cortex.**—Schifone reports experimental research on 25 dogs. Parts of the skull and dura were resected, sometimes to an extent of two-thirds of the entire surface of the hemisphere. None of the animals seemed to be permanently injured by the operation. Solid cicatricial tissue formed over the gaps and became adherent to the cortex, without any manifestations of sensory or motor disturbance. Jacksonian epilepsy developed only in the animals predisposed by some organic or inherited lesion. There was no hernia of brain substance unless the intracranial pressure was abnormally high.

Münchener medicinische Wochenschrift.

90 (LII, No. 7, February 14.) Hemolytic Action of Photodynamic Substances.—Ueber die hemolytische Wirkung der photodynamischen Stoffe. G. Sacharoff and H. Sachs.
91 Automatischer Mischer zur Anstellung von Serumproben (automatic mixer for serum tests). M. Pfaundler (Graz).
92 *Zur Frage der akuten Herz-Dilatation (of heart). H. Starck.
93 Ueber Osteogenesis imperfecta. M. Hohlfeld.
94 2 Fälle von "Sporadischem Skorbut." H. Löhrisch.
95 *Die Pylorus-Stenose der Säuglinge (of infants). J. Schmidt.
96 *Laryngeal Tuberculosis in Pregnant Women.—Weiterer Beitrag zur Kehlkopfschwindsucht der Schwangeren und zur Frage des künstlichen Aborts. Löhnberg.
97 Ueber Star-Operationen und Star-Reifung (cataract ripening and operations). C. Bahr.
98 Obstetric Bag.—Vollständiges geburtshilfliches Besteck. G. Schmauch (Chicago).
99 Twofold Amyloid Reactions.—Zweierlei Amyloid-Reaktionen. E. Neumann and C. Davidsohn.
100 *Treatment of Acute Suppurations with Congestive Hyperemia.—Behandlung akuter Eiterungen mit Stauungshyperämie. A. Bier (Bonn). (Commenced in No. 6.)

92. **Acute Dilatation of Heart.**—Starck emphasizes the importance of the psychic factor in the acute dilatation of the heart in excessive athletic exercise. He describes a typical case in which the heart became extraordinarily dilated during the course of a fencing match, the pulse rising from 70 and 96 to 160, the heart extending from the middle of the sternum to the anterior axillary line on the left and from the second interspace to the sixth rib. Eight hours later the heart had returned nearly to normal size.

95. **Stenosis of the Pylorus in Infants.**—Schmidt has operated on 2 infants on account of congenital stenosis of the pylorus. Both of the little patients were in such advanced inanition that recuperation proved to be impossible, but the findings corroborate the necessity for and value of prompt operation in such cases. Analysis of the literature further shows that congenital stenosis of the pylorus is not so rare in infants as is generally assumed. The severest cases are the only ones recognized. The majority belong to the genuine hypertrophic variety, on an anatomic basis, curable only by surgical intervention. The rare cases of pure pyloric spasm are amenable to internal therapy, as also the relative organic stenosis with compensatory hypertrophy of the stomach. These two varieties may be associated or there may be transitional forms.

96. **Induced Abortion in Treatment of Laryngeal Tuberculosis.**—A ii-para in the third month of pregnancy presented signs of a tuberculous affection of one lung and of the larynx. Both lesions were in a comparatively stationary stage. There was no fever. Löhnberg was consulted in regard to interruption of the pregnancy and advised against it, but the patient, her husband and the attending physician insisted on it. Only transient improvement was noted after the abortion. Fever then developed and the case terminated fatally in three months.

100. **Treatment of Acute Suppurations with Congestion Hyperemia.**—The first part of this article was reviewed in these columns March 18, page 914. Bier here relates examples in detail to show the benefit that follows this method of treating acute suppurations. He says that the directors of hospitals and clinicians generally can apply it in all confidence. They can commence with the milder cases at first. In incipient acute suppurative inflammations of every kind he claims that the "hyperemia by damming" works actual wonders. The subacute inflammations subside regularly and rapidly. It is such a reliable method for suppressing acute infectious foci—incipient suppuration on the limbs or head—that it can be counted on to modify fresh, acute infections and to cure them without any or with very insignificant surgical intervention. Otherwise these processes lead to severe and tedious affections, frequently requiring extensive and mutilating operations. An early diagnosis and application of the congestion hyperemia will abort them in their incipiency. This method will be found particularly valuable for surgical wound infections and for postmortem infection, as the subjects are able to diagnose these lesions at once. Congestion hyperemia is also indicated for acute and subacute inflammation and suppuration in joints. Failures in its application are due to incorrect technic. The congestion must be considerable, but not intense enough to hurt the patient. The constriction should be tight enough to arrest the pain, never to increase it. Intelligent patients soon learn the proper degree of constriction. The pus must be allowed free outlet, but with the least possible mutilation. Congestion hyperemia does not disturb, but promotes the nutritional processes in the tissues. The retarding of the circulation renders harmless the bacteria and their toxins in the part and prevents necrosis by the superabundant nourishment it supplies to the tissues. Revulsion answers the same purpose—inducing hyperemia—but it does this at the expense of injury to the tissues. Congestion hyperemia does all that is necessary, and in the gentlest way. The application of superheated air is in the same therapeutic line, but it induces too intense active hyperemia. He was the first to apply and to advocate superheated air in therapeutics, but has now entirely abandoned it. Congestion hyperemia, on the other hand, resembles the natural defensive processes. The technic of applying a constricting bandage is so simple and easy that physicians have paid scant heed to his method since he first introduced it into therapeutics ten years ago. The technic for the head and limbs is all that is perfected to date. Various apparatus for the trunk have been tentatively applied. A large glass cupping apparatus is now doing good service in suppurative mastitis. It aspirates the pus through comparatively small openings while inducing congestion hyperemia. Similar cupping apparatus have been found useful for furuncles, the apparatus quite large and the suction not very strong.

Therapeutische Monatshefte, Berlin. Liebrich's, Berlin.

Last indexed page 510.

101 (XVIII, No. 6.) Experiments on Diuresis.—Versuch über Diurese, insbes. über die Wirkung des Theocin-natrium aceticum. J. Meinertz.
102 Zur Kenntnis der Strophanthus-Wirkung. G. Günther.
103 Cinnamic Acid Treatment of Pulmonary Phthisis in Country Office Practice.—Erfolge der Zimtsäurebehandlung der Lungenschwindsucht in der Sprechstunde des Landarztes. R. Blum (Haltingen).
104 Nasal Treatment of Heart Affections.—Nasale Therapie von Herzaffektionen. Cholewa (Nauheim).
106 Action of Driburg Mineral Waters on Urinary Affections.—Wirkungen der Caspar Heinrich-Quelle zu Driburg bei Krankheiten der Harnorgane. L. Lünnemann.
107 (No. 7.) Zur Statistik der operativen Behandlung des Mamma-Karzinoms. A. Tietze (Breslau).
108 Zur Wirkungsweise des Cancroins. W. Perlmann.
109 *Prevention of Recurrences After Carcinoma Operations.—Verhütung von Rezidiven nach Karzinom-Operationen. H. Mohr.
110 Die Energeto-Pathologie O. Rosenbachs. F. C. R. Eschle.
111 Gangrän bei Scharlach (in scarlet fever). Netz.
112 Beitrag zur Eisentherapie (iron). Goliner.
113 Praktische Erfahrungen über die spezifische Wirkung des "Lactagol." J. A. Goldmann.
114 Statistics of Diphtheria in Prussia, 1904.—Diphtherie. Liebreich.
115 (No. 8.) Nephroptose und Enteroptose. Aufrecht.
116 Active Principle of Male Fern.—Die wirksamen Bestandteile des Extractum Filicis maris und ihre therapeutische Anwendung. A. Jaquet (Basle).
117 Ueber Diphtherie Statistik. H. J. Bing and V. Ellermann (Copenhagen).
118 Die Behandlung der trockenen und verstopften Nase (dry and stopped-up nose). Volland.
119 Elimination of Boric Acid in Sweat.—Ueber Ausscheidung der Borsäure beim Menschen durch den Schweiss. O. Liebreich.
120 Zur Behandlung Herz-Kranker (patients with heart affections). A. Hecht.
121 *Over-stimulation from Sea Air and Its Avoidance.—Die klimatische Ueberreizung an der See und ihre Vermeidung. Ide (Amrum).

109. **Prevention of Recurrence After Removal of Cancer.**—Mohr discusses the prognosis after operative treatment of malignant disease and expresses his belief that the results observed do not justify the pessimism that prevails in some

quarters. The after-treatment is a more promising field than any further perfecting of surgical technic. An effectual local or general measure to apply after removal of the neoplasm would aid materially in increasing the proportion of permanent recoveries. This is the most urgent problem in the cancer question at present.

121. **Overstimulation from Sea Climate.**—Ide has attempted the task of systematizing the indications that develop during a trip to the seashore. Invalids are overexhilarated by the climatic factors, and, to derive the greatest benefit, individual indications must be studied. There may be cyanosis, hemorrhoidal bleeding, excessive menstruation and a tendency to hemoptysis in the predisposed. The wind and the unusual exercise are the principal causes of this overstimulation. The wind acts like a cold douche. Rest and warmth in bed afterward are an important aid in the reaction. The bed can be by an open window, but rest in bed, even several times a day, will be found an invaluable adjuvant and modifier of the climatic influences.

Zeitschrift f. Geb. und Gynäkologie, Stuttgart.

Last indexed page 168.

122 (LIII, No. 2.) The Reactions of Pregnancy in the Fetal Organs and Their Puerperal Involution.—Schwangerschaftsreaktionen der fötalen Organe und ihre puerperale Involution. J. Halban.
123 Migration of Human Ovum.—Zur Frage der Ueberwanderung des menschlichen Eies. C. Hasse.
124 Statistics of Births at Berlin Gynecologic Clinic, 1888-1902. Geburten der k. Universitäts-Frauenklinik in Berlin Während 15 Jahren. R. Olshausen and Ploeger.
125 Vestiges of Wolffian-Gärtner's Duct in Paravaginal Connective Tissue.—Reste des W.-G. Ganges im paravag. Bindegewebe. T. Leisewitz.
126 Zur path. Anatomie der Puerperal-Eklampsie. H. Petersen.
127 Fibrinorrhea plastica bei Myoma cavernosum und Endometritis chronica cystica. J. Wallart.
128 Zur Frage der Placenta-Adherenz. A. Bauereisen (Erlangen).
129 Various Forms of Involution of Ovarian Follicles and Their Relation to Changes in the Ovarian Vessels.—Ueber die verschiedenen Formen der Rückbildungsprodukte der Eierstocksfollikel und ihre Beziehungen zu Gefässveränderungen des Ovariums, nebst Bemerkungen über Lutein-Zellen-Wucherungen in den Eierstöcken Schwangerer. A. Böshagen.
130 (No. 3.) *Studien zur Physiologie des Uterus. K. Franz.
131 *Zur Klinik und zur konservativen Behandlung der Myome des Uterus. M. Henkel.
132 Der Antitoxin-übergang von der Mutter auf das Kind (natural transmission). O. Polano.
133 Ueber Uterus-Rupturen in Narben von früheren Geburten (in scars from previous births). Three cases. A. Labhardt.
134 Zur Serumtherapie der Streptokokken-Infektionen, speziell des Puerperal-Fiebers. G. Burckhard.
135 Emphysema subcutaneum während des Gebäraktes entstanden (during birth act). H. T. Herman.
136 *Ueber die Blasenmole (vesicular mole). Gottschalk.
137 Pregnancy, Childhood and Puerperium According to the Bible and the Talmud.—Schwangerschaft, Geburt und Wochenbett nach Bibel und Talmud.—E. Preuss (Berlin).

130. **Physiology of Uterus.**—This extensive work is based on study of the isolated uteri of rabbits and of the extirpated uteri in 11 clinical cases. Both the human and the rabbit uteri responded to stimuli in essentially the same way. Heat stimulation elicited particularly marked response. When the uterus of the rabbit was drawn out but left still connected, subcutaneous injection of chloral arrested the "spontaneous" contractions; ergotin started them and increased the tendency to rhythmic reaction to stimuli, while atropin had little if any effect.

131. **Treatment of Myomata of Uterus.**—Henkel discusses the subject of conservative treatment of myomata. The question is how to relieve the patient of her disturbances without danger and without harm otherwise. In malignant disease the aim should be to remove every morbid particle, but in case of a benign growth all that is necessary is to remove the neoplasm itself, and to save everything else. He warns that any and every deviation from this principle is sure to avenge itself sooner or later.

136. **Vesicular Mole.**—Gottschalk gives illustrations of the pathologic anatomy of vesicular mole to sustain his view that the formation is the result of primary disturbances in the circulation through the fetal villi.

Riforma Medica, Palermo and Naples.

Last indexed page 914.

138 (XXI, No. 2, January 14.) *Endothelial Elements in Normal Blood.—Endoteli nel sangue normale: loro rapporti con i leucociti mononucleati, con le forme di passaggio, e con i cosidetti linfociti del sangue. V. Patella.
139 Behavior of Cartilage in Wounds.—Sul comportamento delle cartilagini nelle ferite. G. Fasoli.
140 Changes in Structure of Organs from Injection of Heterogeneous Serums.—Sulle fine alterazioni di struttura degli organi per iniezioni di siero di sangue eterogeneo. G. R. Saeli.
141 (No. 3.) The Saccharifying Diastase of Tubercle Bacillus as New Link to Connect It with the Streptothrix.—La diastasi saccarificante del bacillo della tuberculosi como nuovo carattere di parentela colla streptotrix. C. Fermi.
142 Primary Trephining in Complicated Fracture of Vertex.—La trapanazione primitiva nelle fratture complicate della volta cranica. A. Cernezzi.
143 Mode of Action and Tests of Strength of Serums.—Maniera di azione e controllo di attivita di alcuni siegi antimicrobici. A. Paladino-Blandini. (Commenced in No. 2.)
144 (No. 4.) Cancer-Cirrhosis of the Liver.—Sul cancro-cirrosi del fegato. E. Rollino.
145 Two Cases of Tardy Hereditary Tabes with Congenital Syphilis.—Tabe ereditaria tardiva per sifilide congenita. M. Bertolotti.
146 (No. 5.) L'Orchipina, preparato di testicolo fresco in veicolo oleoso (preparation of beef's testicles in oily vehicle). M. Sciallero.
147 Esame siero-diagnostico di 100 malati presentanti il quadro clinico della infezione tifoidea (study of serodiagnosis). D. Falcioni.
148 Nefrocapsulectomia alla Edebohls per nefrite cronica a forma prevalentemente interstiziale (one case, slight improvement). E. Arcoleo.
149 Sulla patogenesi della dissociazione della sensibilita di origine centrale. U. Benenati. (Concluded.)
150 Echinococco latente del fegato. Ascesso occulto da echinococco (latent liver abscess). C. Bernabei. (Concluded.)

138. **Endothelial Elements in Normal Blood.**—Patella presents numerous arguments to sustain his assumption that in normal blood, besides the red corpuscles, the polymorphonucleocytes and the true lymphocytes, there are no other leucocytes except such as are of endothelial origin, due to a process of desquamation. All the hyaline, non-granulated forms observed are of endothelial origin. In case of endarteritis or of endocarditis, acute or chronic, the hyaline elements in the blood have the value of a pathognomonic sign. The mononuclears observed are the exponent of the changes in the cardiovascular endothelium.

Books Received

Acknowledgment of all books received will be made in this column and this will be deemed by us a full equivalent to those sending them. A selection from these volumes will be made for review, as dictated by their merits, or in the interests of our readers.

THE AMERICAN YEAR-BOOK OF MEDICINE AND SURGERY FOR 1905. A Yearly Digest of Scientific Progress and Authoritative Opinion in All Branches of Medicine and Surgery, Drawn from Journals, Monographs and Text-books of the Leading American and Foreign Authors and Investigators. Arranged, with Critical Editorial Comments, by Eminent American Specialists Under the Editorial Charge of George M. Gould, A.M., M.D. In Two Volumes. Volume I, Including General Medicine; Volume II, General Surgery. Fully Illustrated. Cloth. Price $3.00 net per volume. Philadelphia and London: W. B. Saunders & Co. 1905.

THE URINE AND FECES IN DIAGNOSIS. By Otto Hensel, Ph.G., M.D., Bacteriologist, German Hospital, New York, and Richard Weil, A.M., M.D., Pathologist, German Hospital, New York. In Collaboration with Smith Ely Jelliffe, M.D., Ph.D., Instructor in Pharmacology and Therapeutics, Columbia University; Visiting Neurologist, City Hospital, New York. Illustrated with 116 Engravings and 10 Colored Plates. Cloth. Pp. 334. Price, $2.75 net. Philadelphia and New York: Lea Bros. & Co. 1905.

THE VERMIFORM APPENDIX AND ITS DISEASES. By Howard A. Kelly, A.B., M.D., Professor of Gynecology in the Johns Hopkins Hospital, Baltimore, and E. Hurdon, M.D., Assistant in Gynecology in the Johns Hopkins University, Baltimore. With 399 Original Illustrations, Some in Colors, and 3 Lithographic Plates. Cloth. Pp. 827. Price, $10.00 net. Philadelphia and London: W. B. Saunders & Co. 1905.

ESSENTIALS OF THE PRACTICE OF MEDICINE. Prepared Especially for Students of Medicine. By William R. Williams, M.D., formerly Instructor in Medicine and Lecturer in Hygiene, Cornell University. Double Number. Cloth. Pp. 461. Price, $1.75. Philadelphia and London: W. B. Saunders & Co. 1905.

THE INTESTINAL CATARRHS, Being a Clinical Study of Colitis, Appendicitis and Their Allies; with a Special New Section on Sprue. By Edward Blake, M.D., Member of the Royal College of Physicians. Second Edition. Cloth. Pp. 356. Price, $2.00 net. Chicago: W. T. Keener & Co.

THE OTHER SIDE OF THE LANTERN. By Sir Frederick Treves, Bart., K.C.V.O., C.B., LL.D., Sergeant-Surgeon in Ordinary to H. M. the King. With 40 Illustrations from Photographs, by the Author. Cloth. Price, $5.00 net. Chicago: W. T. Keener & Co. 1905.

AMERICAN ALKALOMETRY. Vol. IV. A Digest of Clinic Teachings, 1902 and 1903. Cloth. Pp. 734. Price, $2.00, delivery prepaid. W. C. Abbott and W. F. Waugh, Editors, Chicago. Chicago: The Clinic Publishing Co. 1905.